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PACIFIC NORTHWEST Executive

A Regional Business Publication of the University of Washington Funded by Seafirst Bank

Salmon Farming: The Potential and the Protest

REGIONWATCH

- Three Tax Reform Alternatives for Washington
- Personal Income Indicators
- The Economic Impact of Industrial Restructuring

Phantom Garbage: How Much Does It Cost Us?

Strategic Networks In the Washington Wine Industry

Commentary

Aquaculture: A Rose with Plenty of Thorns

Aquaculture embraces the cultivation of shellfish, rearing of finfish in enclosed pens (ashore or afloat), and ocean ranching, in which carefully selected stocks of salmon are released from hatcheries and harvested after their return from the open ocean. The real excitement and the technical and emotional conflicts surrounding aquaculture grow out of the explosive worldwide increases in the production of pen-reared salmon and the potential for the expansion of salmon farms in Washington's inland waters.

The astonishing increase in Norway's Atlantic salmon farms followed years of indifferent success in rearing Pacific salmon to market size. In 1978 Norwegian salmon farms marketed a meager 3,500 metric tons. By 1987 production had climbed to 65,000 tons, despite governmental restrictions designed to limit salmon farming to small-scale owner-operator units. The operations are obviously profitable; when 150 new licenses were made available recently, more than 1,500 applications were filed.

The boom is not confined to Norway. Fourteen other countries are now in the game, including Scotland, Japan, Canada, Chile, New Zealand, Ireland, Iceland, and the United States. The rapid spread of international interest has been spurred not only by excellent market acceptance and attractive prices, but also by the desire of Norwegian firms, which have a clear advantage in expertise and capital, to escape the restrictions on the size and number of farms in Norway. Total world production was estimated at 77,700 tons in 1987 and, if prices hold up, is expected to reach 107,000 tons in 1990. By that time, farmed salmon will account for 14 percent of total world salmon production.

Pen-reared salmon have won wide recognition as a premium product admirably suited to luxury markets. Unlike wild salmon, which are produced over a narrow four-month period, fresh farmed fish can be available all year. Large annual increases in production have been absorbed easily, with only one marked price break. Yet there is a good deal of uneasiness about the effect of 200,000 tons of farmed salmon, predicted for the 1990s, on real prices—unless a broad new market can be developed.

In the Pacific Northwest, Washington has lagged far behind British Columbia in salmon farming. In 1985 the state's marine pen-rearing operations totaled seven, compared with more than 100 farms in the province. Both areas have focused on rearing coho in the past, but interest has now shifted to Atlantic salmon, which mature quickly and are larger and less vulnerable to diseases.

Like all roses, however, aquaculture has plenty of thorns for the unwary. Aquaculture enthusiasts in Washington are quick to point a finger at state and local governments as the cause of our miniscule role in what appears to be a booming growth industry—despite loud protestations of support from the departments of agriculture, fisheries, and natural resources. But the delays in developing firm policies toward pen-rearing in Puget Sound and in processing applications for sites reflects a widespread public concern about the actual and possible negative aspects of pen-rearing. Some scientists are concerned about the possible genetic effects of pen-reared Pacific salmon on native stocks and on the remote, but scary, chance that Atlantic salmon will introduce new diseases. Like any other feed-out operation, salmon pens discharge feces, unused food, and chemicals into the surrounding waters. Many people feel that acceptable limits must be much better defined before sensible decisions about salmon pen siting can be made.

Much of the proaquaculture publicity implies that the waters of Puget Sound are woefully underused and that salmon farming represents a net increase in output from the region. But this is patently false. Commercial and sport fishermen, boaters, shore- and upland-view homes, beachcombers, and marine transportation all compete for use of these waters. And many, if not most, of the desirable pen-rearing sites will involve head-on conflicts with these users.

The advantages, stated in conventional economic terms, are not as impressive as some public and private boosters have stated. An average salmon farm in this area would require between 2.5 and 4 acres of water surface and would employ seven to 10 workers at an average annual wage of $19,000. At full operation, the farm would produce 500,000 pounds of salmon, worth $2,000,000 at today's wholesale prices, in a year. Assuming, generously, an equal number of jobs in secondary activities generated by the farms, the total employment provided by 10 active pen-rearing operations—and it seems doubtful that the number of approved sites would be larger—would range from 150 to 200.

Before the full productive potential of pen-rearing can be assessed, there are still technical and biological bottlenecks to be opened. In the short term, shortages of eggs, smolt, and expertise will certainly respond to market signals. But a considerable amount of time and research will be needed to solve the perplexing problems of genetics, nutrition, and disease control.

From the public standpoint, then, there would appear to be real advantages in moving steadily, but cautiously, toward siting policies and operating controls that would fairly balance the unusual number and significance of conflicting uses in Washington's waters. Even if this means that other regions—British Columbia and Chile, for example—move ahead of us for the moment, the markets will still be there, the technical problems will be nearer resolution, and the interests of all Washingtonians will be better served.

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Pacific Northwest Executive is a publication of the University of Washington made possible by a grant from Seafirst Bank.

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Printing
Craftsman Press

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Pacific Northwest Executive is published four times a year in January, April, July, and October by the Graduate School of Business Administration, University of Washington. Permission is granted to quote, with credit.

Correspondence related to subscription or other business matters should be addressed to the Executive Editor, 336 Lewis Hall, DJ-10, University of Washington, Seattle, WA 98195, (206) 543-1819. We welcome requests for inclusion on our mailing list.

The purpose of ***Pacific Northwest Executive*** is to inform managers about economic, business, and public policy issues in the Pacific Northwest. The analyses, conclusions, and opinions expressed are those of the writers and not necessarily those of the University of Washington. Neither the University nor the financial sponsor of the magazine assumes responsibility for the views expressed, and publication does not necessarily imply endorsement.

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Cover photo by Richard G. Shaw

Salmon Farming In Washington: The Issues and the Potential

by Per O. Heggelund

A marine salmon farm, simply stated, is a floating structure of from one to 20 individual netpens (cages) that is anchored relatively close to shore. Salmon farmers can control the freshness, size, flesh color, fat content, and market availability of their products. During the off-season of commercially harvested Pacific species, for example, Washington's salmon farmers continue to supply consumers with fresh fish.

The saltwater farming operation actually begins in freshwater. Farmers strip ready-to-spawn broodstock salmon of eggs and sperm in the fall and winter months. Once fertilized, the eggs are stored in trays, boxes, or baskets fitted with mesh and are constantly flushed with water as they develop. The time from fertilization to hatching takes roughly 60 days, although the process varies with each species and is particularly sensitive to water temperature. When fry, or fingerlings, reach the feeding stage, they are moved to troughs or starting tanks.

Rearing fry to the smolt stage, at which time the fish are capable of adapting to a marine environment, takes from four to 15 months. Smoltification changes a fish's body shape and physical coloration. Once salmon reach this stage, the two- to three-ounce fish are transported to saltwater netpens to begin the grow-out phase, during which time they are given a commercial diet for from nine months (for coho) to two years (for Atlantic salmon). The fish are typically fed 2 percent of their body weight per day; between one and a half and two pounds of feed produce one pound of salmon.

Washington salmon farmers lose 50 percent, on average, of their salmon between the fertilization stage and the time when they can market fully developed fish. The common causes of loss are disease, predation, physiological maladjustment to seawater, escape from the netpens, stress, poor environmental conditions, and naturally occurring floating plants.

The Washington salmon farming industry is now at a crucial point in its development: the novelty of the process has worn off, farmers have been challenged by commercial fishermen and confronted by neighboring landowners, and the state's government has yet to commit itself to the support and promotion of the fledgling industry. At the same time, the demand for seafood continues to climb—both in the United States and the rest of the world.

Global Expansion

Salmon farming has experienced a remarkable global expansion in the last decade. The world production of salmon in netpens has increased more than tenfold, from 16 million pounds in 1980 to 215 million pounds in 1987. Industry projections for the next three years estimate that the amount of salmon raised in enclosures will burgeon to 490 million pounds. By 1990 the world production of farmed salmon will represent almost 25 percent of the total salmon harvest.

This increase in the production of farmed salmon has occurred during a period when traditional salmon fisheries hit an all-time high. This worldwide peak in the wild catch was recorded in 1985, when 1.8 billion pounds of salmon were taken. Since that time, the harvest has dropped to 1.5 million pounds, and most experts predict further declines by the beginning of the next decade.

The increase in aquaculture has been attributed to a jump in the production of Atlantic salmon—152 million pounds of Atlantics were farmed in 1986, compared to 26 million pounds of Pacific salmon. By 1990, if current trends continue, it is possible that the world farmed production of Atlantic salmon will exceed 320 million pounds and that the Pacific salmon total will hit the 140-million-pound mark.

The Scope of the Industry in Washington

The state of Washington's environmental assets and existing infrastructure make it an ideal area in which to establish a salmon farming industry for both Pacific and Atlantic species. The environment's physical and climactic characteristics are similar to such successful salmon growing areas as Norway and Chile. Numerous coastal inlets, fjords, and embayments provide sheltered areas for floating salmon farms. Ocean temperatures, which vary from 43 degrees to 61 degrees Fahrenheit, are within the optimal temperature range for salmon culture, and Atlantic salmon, for example, can grow to more than 80 percent of their annual maximum attainable weight. The Washington Salmon Growers Association estimates that the Puget Sound's 870,000 surface acres are

© Per O. Heggelund

capable of supporting at least 300 acres of farms, which could generate $225 million in revenue annually.

In addition to the state's geographical features, Washington's Department of Fisheries is noted for its salmon enhancement programs, and the region has well-developed academic, commercial, and scientific communities to support the salmon farming industry.

Atlantic salmon, Pacific salmon (chinook and coho), and Donaldson steelhead are grown in farms throughout the Puget Sound region. Pan-sized coho salmon weighing from one-half to three-quarters of a pound are produced in floating marine netpens or in freshwater ponds and raceways. Atlantic salmon, which were introduced from Eastern North America and Western Europe, are grown in netpens in the Puget Sound and are usually marketed in size lots of four to six pounds, six to nine pounds, and nine to 11 pounds per fish.

The largest producer of farmed salmon in the United States—and, perhaps, the world's most extensive salmon farm—is Domsea Farms, Inc., which operates at Clam Bay near Bremerton. Domsea, a subsidiary of Campbell Soup, produced 5.4 million pounds—58 percent of the state's salmon total—in 1987. There are 11 other commercial farms, which produced 4 million pounds of fish, in the Puget Sound, and applications for approximately 20 additional commercial farms are pending.

PAT CHAPIN

Looking for the Ideal Salmon

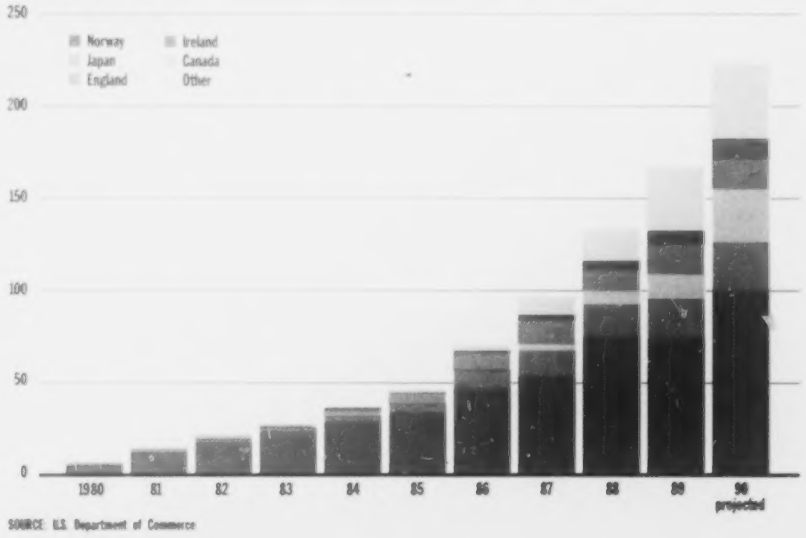
The ideal salmon probably doesn't exist, but researchers and growers have experimented with four different salmon species—coho, Atlantic, chinook, and Donaldson steelhead—to determine which is best suited for farming in the Puget Sound. The biology of salmon and trout is better understood than most other cultivated fish, and this scientific and technical insight has been used to manipulate and advance the aquaculture of these species.

The prominent status of salmon farming in Washington, relative to other regions, is based on the state's long history of scientific research in this field. In 1960 the first salmon farming experiments occurred simultaneously at the Department of Commerce's National Marine Fisheries Services (NMFS) in Seattle and at the Bergen Aquarium in Norway. In fact, a strain of rainbow trout developed by Professor Lauren Donaldson of the University of Washington gave Norway's commercial salmon farming industry its start.

Coho Salmon. In the late 1960s, Domsea Farms, in conjunction with the National Marine Fisheries Services, conducted a feasibility study to investigate the production and marketing of pan-sized salmon that had been raised in saltwater netpens. By the mid-1970s, Domsea Farms was joined by Pacific Ocean Farms, Mariculture N.W., and Aquasea. The Weyerhauser Corporation conducted its own feasibility study in Henderson Inlet near Olympia, and later purchased Oregon Aqua Foods, a large producer of pan-sized coho and a leader in the ocean ranching business. As the saltwater farming industry developed, the demand for coho smolt rose, and a number of small freshwater growers went into business.

Swecker Salmon Farm, located near Rochester, Washington, was one of the early leaders in freshwater smolt production; the operation began in 1974, with a contract to produce 200,000 half-ounce coho smolt. Today Dan and Debbie Swecker's annual production of coho totals 200,000 pounds of 7- to 12-ounce pan-sized salmon and 400,000 fingerlings and smolt. The Rochester area, known for its high-quality aquifer, is the site of three hatcheries, which produce smolt for

Farmed Salmon Production
In thousands metric tons



SOURCE: U.S. Department of Commerce

their own saltwater operations, and two other salmon farms that raise pan-sized salmon—Steelhammer Salmon Farms and Carlson Salmon Farms. The Rochester operations use circular ponds or tanks and pump ground water from local wells. Two other freshwater growers near Morton, Washington—Cascade Aqua Farms and Glenoma Trout Farms—divert stream water through manmade ponds to raise pan-sized salmon. Cascade, like most other salmon farms in Washington, has recently deemphasized its production of coho in favor of Atlantic salmon.

Atlantic Salmon. The National Marine Fisheries Service has selectively bred and domesticated Atlantic broodstock for more than 15 years. At the Manchester Research Station, which is headed by Conrad Mahnken, researchers have noted that Atlantics have a number of advantages over chinook and coho salmon. Mahnken reports that Atlantics grown in a netpen can weigh more than 20 pounds. Coho and chinook, however, are not likely to grow heavier than six pounds. Adult chinook can be afflicted by diseases that are foreign to Atlantics. The Atlantic salmon are tame, due to their long domesticated history, but the wilder chinook need deeper and wider netpens to mature. Both species are fed an identical diet, and they taste about the same. Given the Atlantic salmon's relative ease of farming and the similarity in taste, Mahnken comments, "Why farm peacocks, when you can farm chickens?" Most salmon farmers in the Puget Sound have taken that advice to heart.

The popularity of Atlantic salmon has a long legacy in the Pacific. Early in this century, biologists in British Columbia unsuccessfully introduced Atlantics in an effort to build additional wild salmon runs. Conrad Mahnken and his staff started farming Atlantic salmon in the Puget Sound in 1972, when the National Marine Fisheries Service began developing aquaculture. Mahnken obtained his first Atlantic, a Canadian strain from the Gaspe Peninsula in the Gulf of St. Lawrence, from the Wizard Falls hatchery in Oregon. The Wizard Falls hatchery had been raising salmon in ponds since the 1950s and used them to improve sportfishing in the area.

Washington's salmon farms have obtained Atlantic eggs for their hatcheries from Mahnken's project and from other superior overseas broodstock. Scan Am, one of the first farms in the Puget Sound to emphasize Atlantic salmon, plans to produce 4.5 million pounds annually within the next two to three years, and Seafarms of Washington, located in the Port Angeles harbor, intends to harvest approximately 1.5 million pounds in the same time period. Global Aqua, the new owner of Domsea's netpens and a supplier of salmon smolt for local farms, has abandoned coho smolt production in favor of Atlantic salmon. Swecker Salmon Farm plans to increase its production of smolt to 800,000 by 1989.

Chinook Salmon. The popularity and success of Atlantic salmon farming in Washington has created a demand for Atlantic smolt that has, during the last few years, far surpassed the local supply. This scarcity has prompted Northwest farmers to experiment with raising local chinook stocks in netpens.

The initial reports from the Washington and British Columbia farms express cautious optimism. Canadian salmon farmers, who are restricted by federal and provincial regulations from importing Atlantic salmon seed stock, are particularly hopeful about the commercial applications of chinook. Washington farmers have found that chinook salmon are a better alternative than coho for aquaculture, especially if Atlantic smolt are in limited quantities and part of the farmer's grow-out facility is idle.

The chinook is far from domesticated, and these salmon must be raised in conditions that provide them with a greater volume of water per fish than the Atlantics require. This drawback limits the number of chinook that can be raised per facility, because farms in Washington State are regulated as to the number of surface areas they can cover. In addition, salmon farmers typically sell chinook for 35 to 50 cents less per pound relative to Atlantics. Chinook are similarly priced with Donaldson steelhead.

Donaldson Steelhead. This steelhead is perhaps the first designer salmonid ever produced. The steelhead-rainbow trout hybrid has a genetic trail that leads back to Lauren Donaldson's superspawner, a fish named Susie, developed at the University of Washington. Donaldson produced his cross in the early 1960s, and fertilized eggs from the hybrid were exported to Scandinavia, where the steelhead has become an important contributor in the commercialization of the salmon farming industry, particularly in Finland.

Although the hybrid hasn't been fully commercialized in Washington, the Finns produced 30 million pounds of this species last year. In recent months, innovative Washington salmon farmers obtained permission to import Donaldson steelhead eggs from Finland. Dan Swecker of Swecker Salmon Farm has demonstrated that he can produce a Donaldson steelhead smolt in six months, which is less than half the time it takes to raise Atlantics to that same stage. In the Puget Sound, the steelhead has outperformed the predictions of the most optimistic experts, and the strain appears to be more disease resistant and faster growing than Atlantic salmon.

Markets and Competition

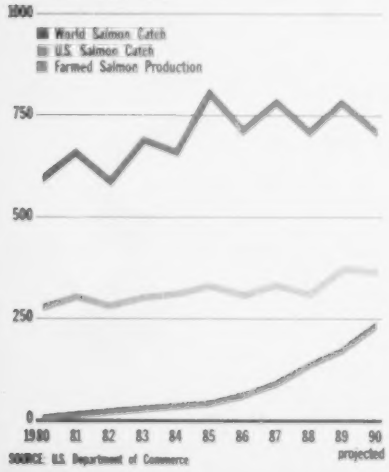
More than three decades ago, the oceans, we thought, contained an enormous untapped supply of seafood. Between 1950 and 1970, the world catch increased from 46 billion to 145 billion pounds, and per capita consumption grew from 19 to 39 pounds. The percentage of annual growth

in the total catch outpaced world population increases until 1970. From 1970 to 1985, the world's catch increased 29 percent, and population grew 33 percent. The Food and Agricultural Organization of the United Nations projects that global demand for aquatic species could reach 250 billion pounds by the end of the century, but production estimates for the same period total only 210 billion pounds. The seafood supply will need to grow at rates well above those of recent years to keep pace with anticipated increases in demand.

The global demand for seafood has important implications for U.S. markets. Consumer demand for seafood in the United States has grown steadily: between 1980 and 1986, per capita consumption rose from 13 to 15 pounds, an increase of almost 15 percent. The rise in consumption has been the result of increases in income, changing lifestyles, and a greater awareness of the health benefits of seafood.

America's growing appetite for seafood is satisfied by a combination of domestic supplies and imports. As U.S. catches of groundfish, salmon, shrimp, lobster, and crab have approached or exceeded the species' maximum biological limits, seafood from foreign fisheries and aquaculture has been imported to meet the increase in consumption. The net result is a persistent seafood trade deficit that has grown from $2.6 billion in 1980 to $7.1 billion in 1987 and shows no sign of diminishing.

Farmed salmon production, and U.S. and world salmon catch
In thousands metric tons



SOURCE: U.S. Department of Commerce

If the upward trend in seafood demand continues, the United States is going to need new sources for seafood in the 1990s. Based on recent projections by the Department of Agriculture, per capita seafood consumption will increase between 5 and 17 percent (above the 1986 base) by the century's end, boosting per capita consumption to between 16 and 18 pounds. In the last decade alone, U.S. imports of fresh farmed salmon rose from 1.6 million pounds (worth $3.9 million) in 1980 to more than 28 million pounds (almost $78 million) in 1986. The U.S. catch of salmon increased 60 percent between 1970 and 1986, but the quantity of salmon available for the domestic market actually declined. Salmon exports in those same 16 years jumped from 28 million pounds to 352 million pounds.

The world's leading salmon farming nations are Norway, the United Kingdom, and Japan. In 1986 these three countries produced approximately 90 percent of the world's farmed salmon. Norway's Atlantic salmon farms have shown the most dramatic growth—from 9 million pounds in 1980 to 100 million pounds in 1986—and that country's salmon farming industry accounts for 75 percent of the world's commercial production of Atlantic salmon.

The key to the short-term global production of salmon is Norway, which could farm as much as 220 million pounds of Atlantic salmon by 1990. The United Kingdom, too, has expanded its production and has superseded Japan as the second largest producer of farmed salmon. Other countries that are rapidly expanding their pen-farmed salmon industries are Ireland, Iceland, the Faroe Islands, Canada, and Chile.

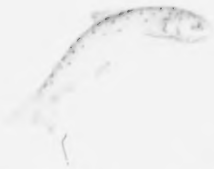
Chile and British Columbia, in the future, are most likely to become Washington's strongest competitors in the U.S. market. British Columbia's advantage lies in the province's positive investment climate for salmon farming, effective trade barriers that protect the fledgling industry, and the region's proximity to the U.S. market. Chile's competitive status is based on low operating costs and its location in the Southern Hemisphere, which adds six months to the fish's growth cycle before it matures. As a result, Chilean salmon can be harvested at an ideal time for a northern market.

Chile's salmon farming industry has shown explosive growth in the 1980s: salmon farming was nonexistent five years ago, yet the industry will produce 18 million pounds in 1988-89. According to Chilean officials, the country now has 100 salmon farms and 25 hatcheries in operation, and these facilities represent an annual production capacity of 100 million pounds of salmon.

The country's geographic location makes it such a formidable competitor. Chile can produce a larger salmon in the off-season, and because of its proximity to the extensive anchovy resource off South America, local farmers have the advantage of low feed costs. In addition to these advantages and savings, Chilean labor costs are only 65 percent of those in North America and Europe.

Chile has the competitive advantage on the East Coast of the United States, and British Columbia holds the dominant position on the West Coast. In fact, when delivering to Western states, British Columbia can reduce its freight costs by 50 percent. These same delivery expenditures double for Chilean and European producers.

This competitive advantage has catalyzed the development of the British Columbia salmon farming industry, which parallels



that of Chile in many respects. The Canadian industry was virtually unknown prior to the 1980s. Today, 125 farms and 30 hatcheries are operating commercially in the province, and these facilities have a projected capacity of 70 million pounds of salmon, which is destined in large part for the U.S. West Coast market. This market focus by the B.C. salmon farmers may eventually create conflict with Washington's developing industry.

Conflicts and Issues

In Washington, the salmon farming industry has been confronted by a number of conflicting interests and major issues. Pacific Coast salmon fishermen, for example, are deeply concerned about the effects of salmon farming on their industry. They see the continued development of netpen farms as a source of competition, both in domestic and foreign markets and in the state's waterways. In some instances, farms occupy the same physical space that fishermen once considered theirs. Fishermen have also criticized salmon farms for the environmental damage that results from the organic wastes produced by floating netpens, for the genetic deterioration of native fish that results from interaction with farmed salmon that have broken free of their netpens, and for the introduction of exotic diseases from nonnative species.

Neighboring landowners argue that the existence of floating salmon farms and their shoreline support structures reduce local property values. Netpens, the landowners maintain, increase the risk of environmental pollution and visually mar the pristine waterways of the Puget Sound. The upland owners, in coalition with local salmon fishermen, have effectively lobbied the Washington State Department of Natural Resources to delay or prevent the department from issuing salmon farm licenses. The lobbying effort, in some cases, has been so thorough that local counties have issued moratoriums on salmon farms within their jurisdiction under the auspices of the Washington Shoreline Management Act.

In addition to these actions, salmon farmers in Washington face an increasing number of nontariff trade barriers. These restrictions stem from a multitude of inconsistent domestic and international regulations that govern the salmon industry. In general, the regulations have been created to protect and preserve the health and viability of marine species. Legislative inconsistencies, however, could pose a threat to the development of the state's salmon farming industry. The federal government, for example, lists salmon as the nation's principal commercial species, with a market value of $600 million, yet, under the terms of the Lacey Act, defines the fish as an "injurious wildlife" species, a designation that typically restricts trade. State regulations make it particularly difficult to trade live salmon products between East Coast and West Coast states. In Canada, federal and provincial regulations prohibit the importation of live fry, smolt, and broodstock from Washington. British Columbia can, however, export these same products to Washington and does so on a regular basis.

Future Prospects

Although these conflicts are troublesome and evoke strong emotions, it is unlikely that they will completely stall the growth of the state's salmon farming industry. To minimize the conflicts, Governor Gardner announced a policy in 1987 to promote aquaculture and, at the same time, maintain Washington's environmental safeguards. The governor also directed state agencies to develop a more coordinated siting process and to reduce current controversies.

While the governor's policy statement is being implemented, the state's salmon farming industry gradually expands. By 1990 the existing farms and the newcomers will harvest 25 million pounds, with a sale value of $75 million. If some of the proposed new technology for fish farming is implemented, this industry estimate may even prove conservative.

At Westport, for example, one company is proposing to establish a land-based salmon farm that will pump seawater into its facility. This venture will eliminate some of the environmental and esthetic objections. Another new high-tech project is proposed for the offshore waters of the Strait of Juan de Fuca. In this unprotected waterway, Seafarms of Washington has been permitted to install ocean netpens for salmon. These enclosures would be located so far offshore that conflicts with landowners would be minimized. Recreational and commercial fishermen, too, should be appeased by this venture's less controversial site.

At some point, however, the introduction of sophisticated technology offers only a marginal return, and salmon farming becomes uneconomical relative to the less technical operations that are based in Chile and British Columbia. Before that happens, Washington's political leadership should assert itself and avoid the narrow focus or half-solutions that have in the past been promoted by the state's regulatory agencies. The salmon farming industry needs a serious aquaculture development strategy based on a positive investment climate. In other states and nations, salmon farming has been successfully promoted and developed by the combined efforts of political and financial leaders. Such leadership could secure Washington's future as the world's foremost supplier of salmon.

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REGION WATCH

Economic Developments in the Pacific Northwest

In November the U.S. economy celebrated the sixth anniversary of its longest peacetime expansion, and it has been an expansion worth celebrating. With the exception of the immediate postrecession surge and the brief hesitation in 1986, real GNP growth has remained steady in the 2 percent to 5 percent range. This growth has created more than 15 million jobs and absorbed 11 million labor force entrants. Unemployment has dropped from 10.6 percent in late 1982 to 5.3 percent in the closing months of 1988. Inflation has remained below 5 percent, which is lower than many had predicted for this stage of the expansion.

This rosy picture is not without its dark undertones, of course. The federal budget deficit remains stubbornly high, as does the trade deficit. The sharp devaluation of the dollar, while improving the country's ability to export, has worsened our terms of trade and increased inflationary pressures. Real interest rates continue to be high by historical standards, and large segments of the banking system are being squeezed between shaky loan portfolios and the recent flattening of the yield curve.

Can the expansion continue? And, if so, for how long? Indications are that the growth can last, perhaps into the early 1990s. Exports continue to increase, consumer confidence is high and spending is strong, business investment is substantial, but not unsustainable, and firms continue to hold down inventories.

Table 1: Components of Real GNP Growth, 1983:I to 1988:II

AVERAGE ANNUAL GROWTH	1983:I TO 1985:IV	1986:I TO 1988:II
Real GNP	5.0%	3.4%
GNP per Worker	2.1%	1.0%
Labor Force	1.6%	1.7%
Employment Rate	1.3%	0.7%

The constraints on the expansionary path are narrowing, however, and our ability to sustain growth without increased inflation is diminishing (Table 1). The two principal restrictions on noninflationary growth in GNP are productivity growth—the primary driver of GNP per worker—and the supply of labor. The labor supply is driven by the size of the labor force and the rate at which it is employed. When unemployment is more than 10 percent and capacity is heavily underutilized—as was the case in 1982—it's hard to overheat the economy. And, indeed, real GNP grew almost 11 percent in the first 18 months of the recovery, before settling down to an average annual growth rate of 5 percent in the first three years. In the process, both GNP per worker and the employment rate increased significantly, as unemployment fell to 7 percent. The labor force continued to grow at its trend rate. Real wages, for the most part, remained stable.

This picture changed markedly in the second half of the recovery: growth in GNP per worker and the employment rate tapered off and unemployment fell from 7 percent to 5.5 percent. Today the constraints on real growth are much tighter than in the earlier stages of the recovery. Any contribution to GNP from further reductions in unemployment will be at the expense of higher inflation. Additions to the labor force have already begun to experience the leading edge of the "baby bust." And productivity growth continues at 1 percent per year, largely because of the ever-declining importance of manufacturing. Even if we allow for some increase in GNP per worker because of longer hours and more full-time jobs, the economy's noninflationary growth path has narrowed to less than 3 percent per year, making the task of economic management increasingly delicate.

Clearly, the tightening of these constraints is on the minds of many of our forecast panelists as they look ahead. After projecting a somewhat stronger growth rate in real GNP for 1988 than for 1987, they indicate a definite slowdown in 1989 and 1990 (Table 2). They also predict that the pace of inflation will pick up in 1989, then, as real GNP growth weakens, level out in 1990.

Regional panel forecast

Most panel members expect the economies of Washington and Oregon to outperform that of the nation in 1989 and project somewhat weaker growth for Idaho and for all three states in 1990. The weaker dollar continues to bolster the export (and prices) of agricultural products, aluminum ingot, and logs. The relative cost of Northwest labor has fallen with the dollar, so the ex-

Table 2: Panel Forecasts
median annual percent changes

	REAL GROSS NATIONAL PRODUCT	IMPLICIT PRICE DEFLATOR
1987 actual	3.4	3.3
1988	3.7	3.4
1989	2.3	4.5
1990	1.9	4.6

	NOMINAL PERSONAL INCOME	NON-AGRICULTURAL EMPLOYMENT	MANUFACTURING EMPLOYMENT
WASHINGTON			
1987 actual	6.7	3.9	3.8
1988	6.9	4.3	4.4
1989	6.9	2.8	1.9
1990	6.1	1.9	1.0
OREGON			
1987 actual	6.9	3.3	3.3
1988	6.7	4.0	3.8
1989	6.5	2.5	1.5
1990	5.8	1.8	0.5
IDAHO			
1987 actual	5.8	−0.2	3.5
1988	5.2	1.5	4.0
1989	5.0	1.2	3.0
1990	5.0	1.1	2.5

port growth of manufactured goods has improved as well. This has been especially helpful to Boeing in its continued head-to-head battle with Airbus, and to lumber manufacturers, who are now selling more lumber abroad than could have been imagined five years ago.

Northwest products also continue to do well in domestic markets. Boeing increased its backlog 20 percent in the first six months of 1988. Lumber production and employment levels in all three states remained high through the first half of 1988, although some activity was lost to labor disputes and forest fire restrictions during the summer. Pulp and paper production also maintained its strength.

The major cloud on the horizon for the economies of all three states is the likelihood of weaker demand for lumber and other wood products. Housing starts fell 10 percent in 1987 and declined at the same rate through the first three quarters of 1988. Forecasts for 1989 suggest a similar drop, which will bring housing starts down to their lowest levels since 1982.

Housing starts fall

Normally this level of decline would have severely jolted the Northwest's lumber manufacturers. But the region's lumber production and prices have been sustained by increased lumber exports (up more than 30 percent in 1987 and an additional 30 percent in the first half of 1988), a strong demand for lumber for repair and remodel projects (up 65 percent from the late 1970s), and greater wood usage per housing unit.

There are a number of reasons to suspect, however, that markets for Pacific Northwest lumber will soften substantially in 1989. A major factor in the region's lumber exports has been a housing boom in Japan, where housing starts are running at higher rates than in the United States. This measure is about 40 percent above what is considered sustainable, and it is expected to subside during the next two years.

Higher mortgage rates are taking their toll in the resale of existing homes and in the home repair and remodel market. There is concern that, in the coming year, the Canadian dollar will lose value relative to the U.S. dollar, which will increase the competitiveness of Canadian lumber in the United States. And while lumber manufacturers have sharply reduced production costs in the 1980s, the Northwest continues to be a relatively high-cost producing region, one that is particularly vulnerable to a downturn in demand.

Many in the Pacific Northwest had expected that grain farmers would reap a major windfall when the crop failures in the Midwest drove up prices. And prices have risen, from a 1987 average of $2.85 per bushel for Washington winter wheat to $4.09 per bushel in September 1988. The higher market price, however, does not necessarily mean a higher price to the farmer. In 1987 Northwest wheat growers received federal deficiency payments of $1.81 per bushel. This year the payment is expected to drop to $0.65 or less per bushel, based on an expected U.S. average price of $3.60 to $3.80. This means that many wheat farmers will net about the same total price (including the deficiency payment) as last year. But others sold this year's crop forward at $3.20 or less per bushel in the spring and, with lower deficiency payments, will receive substantially less than they did last year. Many wheat farmers in the Northwest also had lower yields because of late spring rains. In sum, the variation in total harvest value among wheat farmers was much higher in 1988 than in most years. And, most certainly, the great drought did not create a windfall.

No windfall from the drought

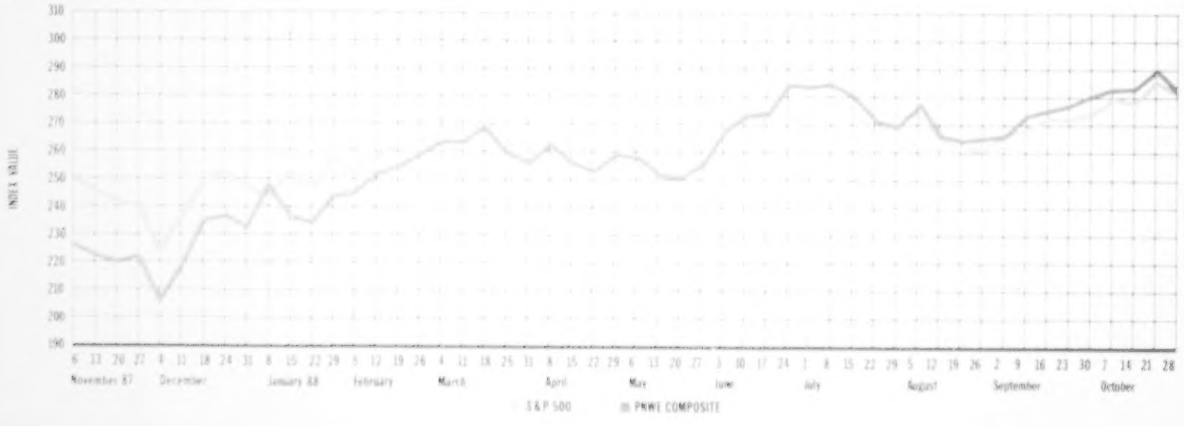
STAFF CHANGES

Dr. Paul Sommers, the magazine's research director since its first issue, has left the staff to join the Northwest Policy Center, a research branch of the UW's Institute for Public Policy and Management. His thoughtful contributions to the Regionwatch section of *Pacific Northwest Executive* have established that section's reputation for objectivity and accuracy. We wish him all the best.

Steven Bryan Bieler, our editorial assistant, has accepted a position on the staff of the *Seattle Weekly*. We congratulate him on his new job and wish him well.

The Pacific Northwest Executive Stock Index

S&P 500 and the PNWE Index, November 6, 1987–October 28, 1988



Industrial Restructuring and Changing Patterns of Employment and Earnings in the Pacific Northwest

The 1980s have become a major watershed for the post-World War II U.S. economy. Although employment growth has been concentrated to an increasing extent in the service sector, most industrial sectors prior to 1980 continued to expand their payrolls and add new jobs. In this decade, however, manufacturing employment has remained persistently below previous levels. Even after five years of sustained economic growth and an increase of 13 million jobs, U.S. manufacturing employed 9 percent fewer workers in 1987 than in 1979.

The roll call of affected industries is a long one, ranging across primary metals and fabricated metal products, petroleum products, nonelectrical machinery, textiles, apparel, and stone, clay, and glass products. In each of these cases, employment remains from 10 percent to 40 percent below the levels of the late 1970s.

The loss of jobs, however, has not meant a loss of output. In all but a few sectors (most notably, primary metals and petroleum products), production is at an all-time high. But investment in new technology, the elimination of inefficient operations, and stricter control of overhead costs—the key elements of industrial restructuring—have increased productivity at almost twice the annual rate reported in the 1970s. As a result, manufacturing output per worker has increased by more than 25 percent since 1979.

In addition to the loss of many higher paying jobs, industry's reduced demand for workers has meant continued downward pressure on manufacturing wages. The wage restraint generated by the deregulation of communications and truck and rail transportation has further compounded the problem. All told, the average weekly earnings of manufacturing production workers declined 3.7 percent between 1979 and 1987 (in constant dollars), and the average earnings of all production workers dropped 9.2 percent. These decreases reflect both the inability of wages in many jobs to keep pace with inflation and the shift in the mix of jobs toward positions with lower pay.

The net result of this restructuring has been an accelerated transformation in the economy's sources of earnings income. The contribution of earnings in the service sector to real per capita income increased dramatically in the 1980s (Figure 1). At the same time, the contributions of manufacturing, mining, transportation, and communications, after having made modest gains in the 1970s, fell from 35 percent of nonfarm earnings to 29 percent. Most other sectors, including trade and government, grew at a moderate rate.

The economic impact of these changes has been felt in many parts of the United States. The traditional manufacturing states of the Upper Midwest, which is now often referred to as the Rustbelt, and the oil-rich states of the Southwest and Southcentral regions, have been particularly hard hit. In both of these areas, the impact of the 1981-82 recession and its subsequent restructuring linger on in the form of significantly reduced manufacturing employment and lowered real income. And the demand for many of the traditional products of these regions may never recover sufficiently to offset the effects of increasing productivity, continuing competition from alternative sources of supply, and changing consumer preferences on employment.

The Pacific Northwest has also been confronted by many of the same forces that have driven restructuring in the Midwest and elsewhere: the reduced demand for traditional products, the increase in foreign competition, and the push for significant gains in productivity. Looking at the three states in the region, we find that each has shared the experiences of restructuring, but with markedly different results.

Washington: One Prosperous Firm

Washington, alone among the three states, has enjoyed substantial growth during the 1980s. Even manufacturing employment is above the 1979 level. But with 25 percent of the manufacturing labor force employed by one prosperous firm, the aggregate employment numbers can be deceiving. Washington has done better than the rest of the region, but the state has not escaped industrial restructuring.

Total employment in the state grew 16 percent, in part because of the indirect impacts of aerospace employment. But, apart from aerospace, manufacturing employment fell 5 percent from 1979 to 1987, with job losses most visible in wood products and shipbuilding. Although lumber production in Washington was higher in 1987 than in 1979, the industry employed 25 percent fewer workers at substantially lower real wages. Other industries that have reduced their employment levels by 10 percent or more since 1979 include shipbuilding (50 percent), primary metals (35 percent), fabricated metal products (10 percent), apparel (18 percent), and petroleum and petroleum products (12 percent).

The collapse of the Washington Public Power Supply System (WPPSS) in the early 1980s had a unique influence on earnings in Washington. The large layoffs that resulted from the closed-down project helped push construction employment rates 16 percent below the 1979 level; neither the completion of Interstate 90 nor the high-rise office boom in Seattle and Bellevue has been able to take up the slack. More important, Real construction wages have dropped by more than 20 percent since 1979.

With the exception of construction, employment in most of Washington's nonmanufacturing sectors increased about 20 percent between 1979 and 1987, largely because Seattle has been such an active regional center for the Northwest's finance, business services, and trade communities. Despite the various strengths of the Washington economy in the 1980s, however, income growth still lags behind that of the

nation. Real wages in some sectors, particularly trade and transportation and communications, have declined between 5 percent and 8 percent. The combined impact of decreased employment and lower real wages reduced manufacturing's contribution to real per capita earnings by 11 percent. In wood products alone, real earnings were 44 percent lower in 1987 than in 1979. Still, the largest single negative factor was the drop in construction earnings, which was larger than the total of the earnings declines in nonaerospace manufacturing, trade, and transportation and communications. In fact, the weakening of Washington's income position, relative to that of the rest of the United States, is largely explained by the residual effects of two major events from the early 1980s: the collapse of WPPSS and the restructuring of the wood products industry.

Oregon: A Classical Restructuring

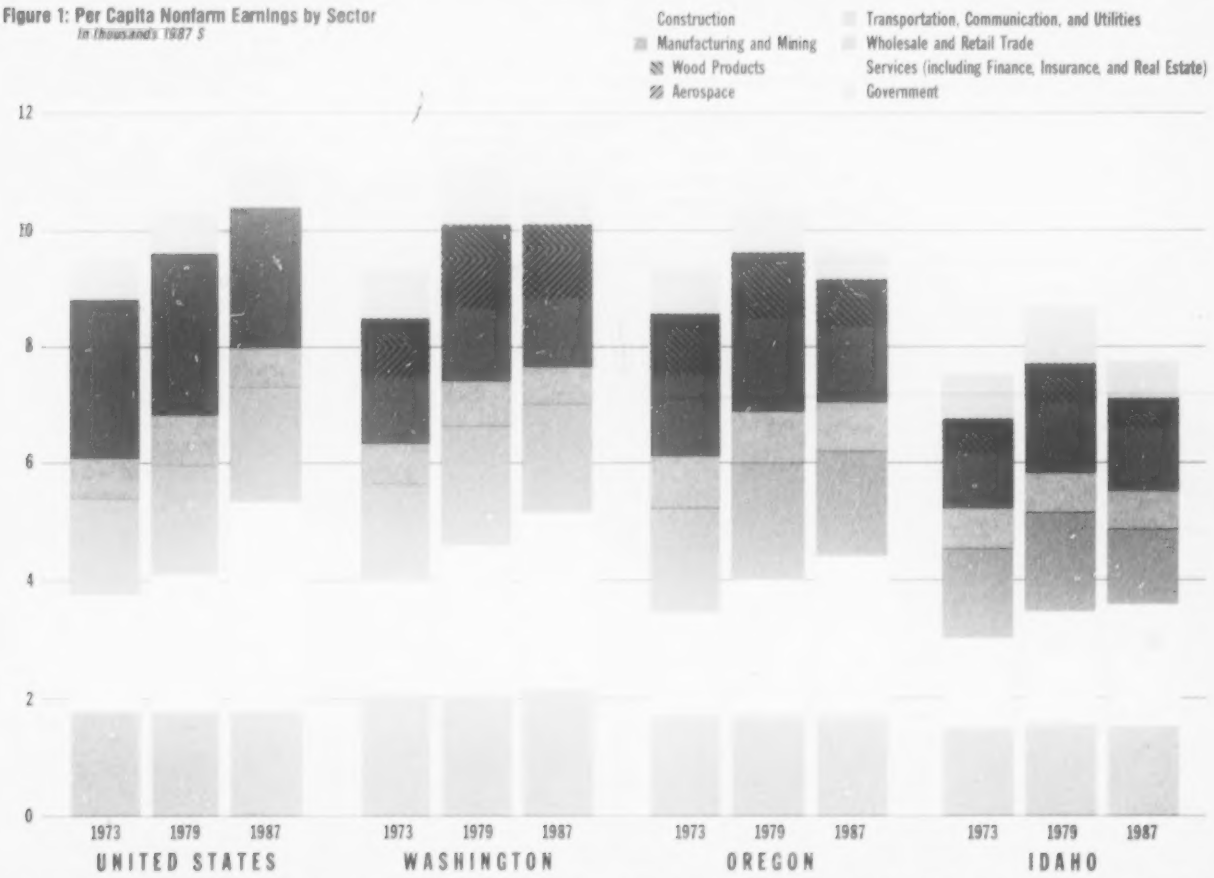
Oregon has gone through what might be called a classical restructuring, and employment in virtually every manufacturing sector is now 10 percent below 1979 levels. Oregon's two principal industries are wood products and food processing, but, in this state, the wood products industry employs 70 percent more workers than it does in Washington and three times as many workers as in Idaho. The impact of restructuring has been correspondingly larger.

Nevertheless, production in most sectors is up, reflecting the fact that productivity growth has significantly reduced labor requirements since 1979. The bright spots in this picture are electrical equipment and electronics, and rubber and plastic products —sectors in which employment continues to grow at rates above the national average. But these sectors only account for 8 percent of manufacturing employment in Oregon.

Nonmanufacturing in Oregon has also performed weakly. Construction employment is down 35 percent, largely in response to the general stagnation of the state's economy. Railroad employment has dropped 50 percent, and mining employment is 40 percent less. Federal employment levels have been virtually static, after 15 percent growth in the 1970s. In sum, total employment is up only 4 percent in the eight years since 1979, compared with a 30 percent increase between 1973 and 1979.

The impact of these changes on real earnings has been substantial. Led by a 34 percent loss in wood products earnings, per capita earnings in manufacturing dropped 22 percent between 1979 and 1987. Manufacturing's share of real nonfarm earnings

Figure 1: Per Capita Nonfarm Earnings by Sector
In thousands 1987 $



Note: Earnings include gross wages, salaries, and income from proprietorships and partnerships. Total earnings for each sector are divided by state (or United States) population, and the earnings for 1973 and 1979 are adjusted to 1987 dollars, based on the Personal Consumption Deflator from the National Income Accounts.

SOURCE: U.S. Bureau of Economic Analysis

declined from 26 percent to 22 percent, and total per capita real earnings fell 15 percent. In Oregon, more than any state in the region, a lot of good jobs have been eliminated, and many good jobs lost earning power.

Idaho: A Weak Recovery

Of the three states, Idaho has had the weakest recovery. After the severe recession of the early 1980s, the state has barely returned to the employment levels of nine years past. This is in sharp contrast to the period from 1973 to 1979, when Idaho's employment grew 34 percent, which was almost the same rate of growth that Washington recorded. The weakness of Idaho's economy in the 1980s is due in part to the same general restructuring that other parts of the country have experienced, but it is also the product of a series of special circumstances.

As in the rest of the Northwest, manufacturing in Idaho is highly concentrated. Just two sectors, wood products and food processing, account for more than 55 percent of manufacturing employment—which is down from over 60 percent in the 1970s—and neither industry has done well at providing good jobs in the 1980s. Employment in wood products is still 28 percent below its 1979 peak, even though lumber production is now back at 1979 levels, and food processing employment is down 8 percent.

While the forces of restructuring are evident in some Idaho industries, the state has managed to overcome national trends in others. Machinery manufacturing grew from 2 percent of Idaho manufacturing employment in 1973 to 8 percent in 1979 and now stands at 10 percent. Chemicals, electrical equipment and electronics, and printing and publishing have also shown strong growth.

What has made the situation in Idaho exceptional has been the behavior of a number of nonmanufacturing sectors. Federal employment, for example, grew 25 percent in the 1970s, then declined 10 percent in the 1980s. Railroads cut their employment rolls by 50 percent in the 1980s, and the communications sector dropped 30 percent of its workers. After the completion of a number of major public and private projects in the early 1980s, the construction sector also pared its employment figures. The loss of jobs in metals mining, though small in absolute numbers, had a highly concentrated effect on several small communities in northern Idaho.

The effects of these changes on income in Idaho have been noticeable. Led by a 38 percent decline in the earnings of wood products workers, real manufacturing earnings fell 17 percent between 1979 and 1987. Manufacturing's share of real nonfarm earnings declined from 22 percent to 20 percent, and overall real per capita earnings shrank 11 percent. As in the remainder of the United States, most of these declines were brought about by the loss of better paying jobs across a number of sectors. But much of the change was also in response to the lower real wages of workers, especially in the wood products sector.

On balance, the impact of economic restructuring on Idaho has been uneven. In the absence of the sharp drop in wood products, manufacturing employment would actually have increased. The gains in other manufacturing, however, were more than offset by the employment declines in those sectors of Idaho's economy that are outside of manufacturing.

The Long-Term Impacts of Restructuring

Clearly, one of the Pacific Northwest's most important manufacturing sectors, wood products, has been acutely affected by industrial restructuring. Strong foreign and domestic competition from Canada and the South has exerted substantial downward pressure on wages and has created the impetus for large gains in productivity and sharp reductions in many firms' overhead costs. As a result, the Northwest's lumber and wood products industry has become competitive again and has recovered much of its former market share.

But there appears to be little opportunity for the regional industry to regain its preeminent position as an income generator. Nonmarket constraints on the availability of public timber and the reduced supply of timber in private hands preclude a major expansion of production and employment. In the future, continued market pressure from alternative supply sources will act as both a restraint on wages and a goad to further increases in productivity.

Similarly, it does not appear likely that the region will again experience massive public works projects on the scale of WPPSS or the Columbia and Snake River dams that preceded WPPSS in the 1950s and 1960s. The Northwest can no longer support such large construction labor forces at premium wage rates.

The impact of deregulation on employment and earnings in the transportation and communications sectors of the region can be described as a unique event that involved a one-time adjustment in the labor force, much of which has already occurred. In the absence of new foreign or extraregional competition, these sectors should grow with the rest of the regional economy.

On a state-by-state basis, the future looks bleakest in many ways for Oregon. Although electronics and rubber and plastics are growing, vital sectors, they are simply too small to carry the economy. And the forces that have made industrial restructuring such a painful process in other parts of the United States continue to influence a broad range of Oregon's industries. There seems little likelihood that the state's traditional industries can expand enough in the near future to increase manufacturing employment much above 1987 levels.

Although Idaho has, in many ways, taken the most time to recover from the 1981-82 recession, its future looks somewhat brighter. The Boise area's manufacturing base has a strong mix of growing companies. And mining in northern Idaho also appears to be making a comeback. The more traditional manufacturing sectors, however, continue to be handicapped by persistent problems.

Projecting the future for Washington's industrial economy is difficult because of the confounding effect of aerospace. The indications point to further expansion of employment in this sector, but the industry is also under severe cost pressure from Airbus, its major foreign competitor. Of the other manufacturing sectors in the state, primary metals still show potential weaknesses, and machinery, electrical equipment, chemicals, and instruments demonstrate potential strengths. Important nonmanufacturing sectors, such as business and legal services and health care, will continue to expand.

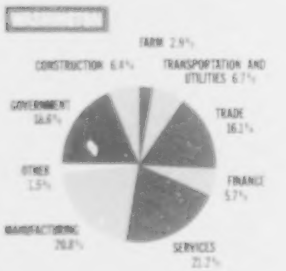
Perhaps the most worthwhile question for Washington is whether the state can recover the 8 percent to 10 percent per capita income advantage over the rest of the United States that it has historically enjoyed. Much of Washington's lead was based on the premium construction wages associated with the massive public works projects of the last 30 years, and the high wage rates that are no longer competitively viable in the forest products industry. Without those advantages, Washington's income premium is unlikely to return. ılı

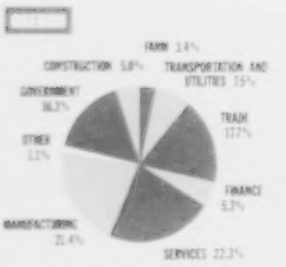
REGION WATCH

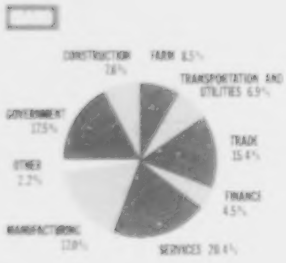
MAJOR VARIABLES, 1987

	WA	OR	ID
Total Personal Income (in millions $)	70,795	38,245	11,847
Population (in thousands)	4,538	2,724	998
Personal Income Per Capita (in $)	15,599	14,041	11,868
Rank Among States			
Personal Income	18	30	43
Personal Income Per Capita	15	30	45

SOURCES OF PERSONAL EARNINGS, 1987







TOTAL PERSONAL INCOME
In millions $

YEAR	WA	OR	ID
1940	1,130	646	236
1941	1,532	867	297
1942	2,254	1,248	436
1943	2,938	1,681	507
1944	3,234	1,721	559
1945	3,143	1,696	552
1946	3,188	1,836	608
1947	3,315	2,035	663
1948	3,633	2,295	739
1949	3,633	2,279	727
1950	4,082	2,526	784
1951	4,509	2,832	879
1952	4,800	3,010	961
1953	5,071	3,058	923
1954	5,203	3,026	932
1955	5,482	3,269	981
1956	5,761	3,500	1,078
1957	6,126	3,502	1,138
1958	6,281	3,594	1,165
1959	6,671	3,892	1,234
1960	6,914	4,019	1,263
1961	7,261	4,168	1,340
1962	7,831	4,432	1,437
1963	8,054	4,678	1,469
1964	8,418	5,039	1,518
1965	9,094	5,497	1,736
1966	10,322	5,952	1,771
1967	11,277	6,310	1,882
1968	12,532	6,874	2,004
1969	13,593	7,524	2,260
1970	14,234	8,169	2,486
1971	14,961	8,920	2,723
1972	16,163	10,006	3,097
1973	18,300	11,342	3,635
1974	20,722	12,816	4,265
1975	23,258	14,072	4,548
1976	26,071	16,058	5,148
1977	29,153	18,682	5,673
1978	34,250	20,822	6,579
1979	39,486	23,658	7,289
1980	44,562	26,063	8,129
1981	49,260	27,889	8,946
1982	51,420	28,263	9,079
1983	54,552	30,010	9,778
1984	58,416	32,302	10,367
1985	61,953	33,955	10,663
1986	66,343	35,778	11,192
1987	70,795	38,245	11,847
1988 I*	74,473	40,074	12,308
1988 II*	75,876	40,836	12,609

*Annual rates

PERSONAL INCOME, 1987
In millions $

	WA	OR	ID
TOTAL PERSONAL INCOME BY PLACE OF RESIDENCE	**70,795**	**38,245**	**11,847**
Nonfarm Personal Income	69,309	37,327	11,130
Farm Personal Income	1,486	918	717
Population (in thousands)	4,538	2,724	998
Per Capita Personal Income (in dollars)	15,599	14,041	11,868
DERIVATION OF TOTAL PERSONAL INCOME			
Earnings by Place of Work	50,487	27,233	8,460
Less: Personal Contribution for Social Insurance	3,005	1,805	560
Plus: Adjustment for Residence	398	(226)	84
Equals: Net Earnings by Place of Residence	47,880	25,201	7,984
Plus: Dividends, Interest, and Rent	11,850	6,901	1,970
Plus: Transfer Payments	11,065	6,143	1,894
COMPONENTS OF EARNINGS BY PLACE OF WORK			
Wages and Salaries	40,828	21,338	6,170
Other Labor Income	3,457	2,008	545
Proprietors' Income	6,203	3,886	1,745
Farm	1,171	724	567
Nonfarm	5,032	3,163	1,178
EARNINGS BY INDUSTRY			
Farm	1,486	918	717
Nonfarm	49,001	26,315	7,743

NONFARM EARNINGS BY INDUSTRY, 1987
In millions $

	WA	OR	ID
AGRICULTURAL SERVICES, FORESTRY, FISHERIES, AND OTHER	638	252	86
Agricultural Services	223	112	76
Forestry, Fisheries, and Other	415	140	10
MINING	120	49	103
CONSTRUCTION	3,229	1,367	639
MANUFACTURING	10,507	5,838	1,436
Nondurable Goods	2,689	1,447	646
Food and Kindred Products	751	510	345
Paper and Allied Products	681	382	75
Printing and Publishing	471	296	75
Chemicals and Allied Products	449	66	123
Durable Goods	7,818	4,390	789
Lumber and Wood Products	1,153	1,932	436
Machinery, Except Electrical	468	487	156
Primary Metal Industries	415	342	2
Transportation Equipment	4,296	182	14
TRANSPORTATION AND PUBLIC UTILITIES	3,386	2,030	587
Railroads, Trucking, Water, and Other	2,152	1,251	354
Communication	902	392	114
Electric, Gas, and Sanitary Services	332	387	120
WHOLESALE TRADE	3,062	1,869	441
RETAIL TRADE	5,047	2,952	864
FINANCE, INSURANCE, AND REAL ESTATE	2,889	1,452	379
Banking	1,140	522	159
Other Finance, Insurance, and Real Estate	1,749	930	220
SERVICES	10,697	6,060	1,727
Business Services	2,190	1,084	399
Health Services	3,275	2,111	513
FEDERAL AND CIVILIAN	1,992	879	319
MILITARY	1,247	112	154
STATE AND LOCAL	6,166	3,456	1,007
TOTAL NONFARM EARNINGS	49,001	26,315	7,743

NOTES:
1. Bureau of Economic Analysis, U.S. Department of Commerce.
2. Transfer payments are defined as payments to individuals for which they do not render current services.
3. The percent change is calculated on a quarter-to-quarter basis and is annualized — called annual rates.
4. Both Florida and Colorado rank 16th.

PERSONAL TAX AND NONTAX PAYMENTS, 1987
In millions $

	WA	OR	ID
FEDERAL GOVERNMENT (net of refunds)	7,013	3,396	883
Individual Income Tax (net of refunds)	6,734	3,257	845
Individual Income Taxes (gross)	8,042	3,890	1,041
Less: Refunds	1,308	634	196
Fiduciary Income, Estate and Gift, Nontax	279	139	38
STATE GOVERNMENTS	616	1,958	386
Individual Income Taxes	0	1,536	254
Death and Gift Taxes	21	17	3
Motor Vehicle Taxes	98	48	29
Other Taxes	26	20	14
Nontax Payments	471	339	85
LOCAL GOVERNMENTS	590	315	192
Other Local Taxes	27	24	2
Local Nontax Payments	563	292	190
STATE AND LOCAL PERSONAL PROPERTY TAXES	70	0	0
TOTAL PERSONAL INCOME	70,795	38,245	11,847
Less: Total Personal Tax and Nontax Payments	8,228	5,669	1,461
Equals: Disposable Personal Income	62,506	32,576	10,386
PER CAPITA DISPOSABLE PERSONAL INCOME	13,773	11,960	10,404

TRANSFER PAYMENTS, 1987[2]
In millions $

	WA	OR	ID
GOVERNMENT PAYMENTS TO INDIVIDUALS	10,355	5,734	1,748
Old-Age, Survivors and Disability Insurance	3,719	2,535	771
Medical Insurance Payments	2,234	1,203	349
UNEMPLOYMENT INSURANCE BENEFITS	423	246	85
INCOME MAINTENANCE BENEFIT PAYMENTS	852	396	102
Aid to Families with Dependent Children	410	174	21
Food Stamps	161	138	38
VETERANS BENEFIT PAYMENTS	356	207	63
BUSINESS PAYMENTS TO INDIVIDUALS	426	255	97
TOTAL TRANSFER PAYMENTS	11,065	6,143	1,894

PERCENT CHANGES IN[3] PERSONAL INCOME

YEAR	QTR	WA	OR	ID
1983	1	0.5	1.4	−0.2
	2	2.4	2.3	3.1
	3	0.7	1.0	0.9
	4	4.9	3.4	6.0
1984	1	0.5	1.8	−1.8
	2	0.8	1.1	0.5
	3	1.9	1.6	1.7
	4	1.2	1.5	3.1
1985	1	2.2	1.5	1.0
	2	1.0	0.9	0.2
	3	0.9	0.5	−0.5
	4	2.0	1.8	2.5
1986	1	1.7	1.3	−1.3
	2	1.9	1.4	1.8
	3	1.6	1.3	1.8
	4	3.4	1.6	1.7
1987	1	0.1	1.4	0.6
	2	1.9	2.3	2.5
	3	1.3	1.6	1.3
	4	2.5	2.1	−0.1
1988	1	2.1	1.8	2.6
	2	1.9	1.9	2.4

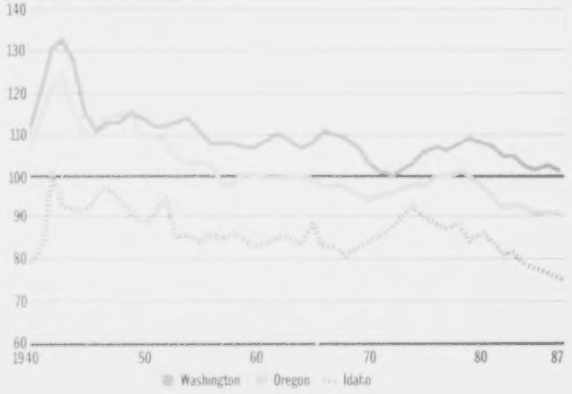
An Explanation of Personal Income

State personal income accounts constitute the single most important source of information about the income conditions of a state's residents. Used in conjunction with other statistics such as population, employment, and price changes, personal income data not only form the basis for determining people's well-being on a geographic basis, but are useful in making economic forecasts, assessing market opportunities, and determining the allocation of payments for governmental programs. Personal income data are an indispensable tool for analyzing regional economic change.

A state's personal income is defined as the income received by, or on behalf of, its *residents*, excluding those who are temporarily working abroad. It consists of income received by individuals from all sources: wages and salaries of employees, net income of proprietors, dividends, net interest, rent, and transfer payments. Personal income is a description of the income people received, as distinct from Gross National Product, which measures the value of goods and services produced.

The Bureau of Economic Analysis (BEA), a section of the U.S. Department of Commerce, estimates personal income based on data supplied by the employment security departments of each state and the other governmental agencies. The BEA reports national personal income estimates monthly, while it publishes estimates for states quarterly with a lag of about five months. These estimates are refined as more complete data become available. The BEA makes county estimates on an annual basis, with publication lagging more than a year. Although the quality of data varies, the methods of estimation assure consistency across states and with national aggregates.

PER CAPITA PERSONAL INCOME
as percent of U.S. 1940-1987



PERSONAL INCOME PER CAPITA AND RANK 1987[4]

Forecasting the Effects of Alternative Tax Reform Measures on Washington

by David C. Clark and Kathleen S. Morse

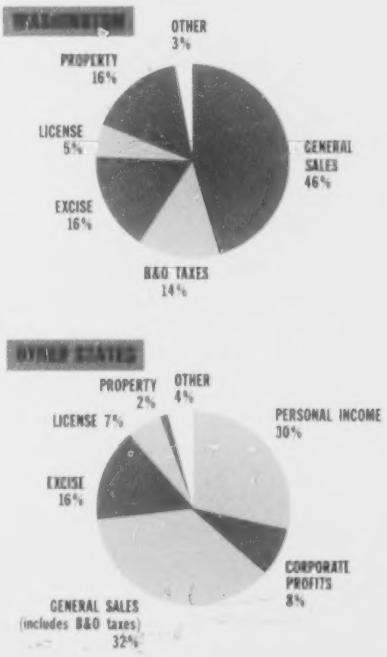
Proposals to modify taxes—to fund new programs or support a particular industry—are presented in virtually every state legislative session, with varying degrees of success. Plans for major tax reforms, however, have not fared well. Washington residents have voted three times—in 1970, 1973, and 1982—on proposals to institute personal income taxes, but the referenda have been soundly defeated. Corporate profits taxes have also been proposed, but voters refused their support in 1973 and 1975.

Two events have now changed the economic and political landscape. First, federal tax reform has eliminated the sales tax deduction, and the state's residents, according to a recent paper by Peter Nickerson of Seattle University, paid an extra $332 million in 1987 federal income tax. Washingtonians pay one of the highest rates of sales taxes in the nation, and the state relies on its sales tax for 46 percent of general fund revenues, compared with an average for other states of 32 percent. (If Washington's property tax funding for schools were not included in these figures, the state's reliance on the sales tax would be much higher.) State personal income taxes remain deductible for federal tax purposes, but Washington has no personal income tax (Figure 1).

Second, the 1980-82 recession has focused attention throughout the United States on the increasingly competitive nature of the world and national economies. Many states are taking a closer look at the effects of their tax systems on economic development, and some have passed legislation to create more hospitable tax environments for new and existing businesses.

Although major tax reforms have yet to be instituted in Washington, the state has been active. In 1986 the Department of Revenue commissioned Robert Strauss of the Carnegie-Mellon Institute to examine alternative tax structures in light of their likely effects on Washington's competitiveness with other states. Strauss derived tax rates, similar to those of other states, which were based on revenue neutrality—the assumption that total tax revenues would not change with the new tax structure. David Birch of MIT examined Washington's economy and concluded that the primary engines of job growth are small and new firms, which are not typically profitable in their early years. Critics of the current tax structure often argue that since the Washington business and occupation (B&O) tax is applied to gross receipts, rather than to profits, the state's heavy reliance on the B&O tax places an unnecessary burden on the smaller and start-up firms. Furthermore, Washington's high sales tax rate, which applies to purchases of plant and equipment, has been blamed for hindering investment.

Figure 1: Distribution of Tax Revenues by Source, Washington and Other States



The debate over whether Washington should revise its tax system—and, if so, how—has many dimensions, including equity, ease of administration, and concerns that tax reform might be seen by the public as a tax increase in disguise. In Olympia, legislators worry about the economic stability of tax revenues in times of both recession and growth. The state's dependency on the sales tax, which is among the most volatile taxes across economic cycles, makes it difficult for Washington's tax revenue forecasters to predict the state's ability to fund government programs.

Federal tax reform and economic development now play a new role in the effects of taxes on the welfare of the state's residents and businesses. While past analysts have examined the direct distribution of tax burdens across industries and households, researchers have yet to evaluate the changes that such a tax system might have on the state's personal income levels and employment over time.

This lack of analysis is understandable. Predicting the ultimate economic consequences of tax reform is extremely difficult in light of the complexities and the ever-changing economic structures of Washington, the United States, and the global arena. Laws and regulations that are meant to assist one segment of the economy often have unintended, and sometimes counterproductive, effects once the economy adjusts. Until recently, there was no economic forecasting and simulation model suited to the task of predicting the overall implications of tax reform for Washington.

In this first attempt to view the big picture of tax reform—to examine tax reform-stimulated changes in the key economic indicators that describe the overall health of the state's economy—we addressed three questions. What are the overall impacts of

representative tax reform packages on Washington's economy? Which segments of the state economy—households or businesses—would stand to gain or lose from alternative tax reform programs? What might be the nature of future adjustments to new tax programs in light of their effects? A particular set of tax rates, for example, may be revenue neutral in the first year. If those taxes increase economic growth by the next year, however, the relevant tax base will have grown, and tax receipts will rise. In such a situation, it may be possible to further reduce tax rates, while maintaining revenue neutrality.

This analysis relies on two computer models of the Washington State economy. The first is the Tax Alternatives Model, developed by the Washington Department of Revenue (DOR). With this model, users can estimate the fiscal year 1989 tax receipts that would result from different tax structures, as well as evaluate the direct costs to a variety of businesses and households. The second model, and the workhorse of this analysis, is the HED Model for Washington, which was developed in early 1988 by the Human Affairs Research Centers and Regional Economic Models, Inc. HED, an economic demographic forecasting and simulation model, is a sophisticated and powerful representation of the state's economy with several features that make it well-suited to the task of evaluating the economic implications of tax reform.

- The HED Model can account for most of the primary factors that influence the state's economy and does so in a dynamic sense. Dynamic, in this instance, means that the model incorporates the time that households and businesses often require to adjust to changes in their economic constraints and opportunities.
- HED traces economic interactions through the economy, for, as firms change their behavior, substantial ripple patterns are created. Firms may purchase more or less from other firms, which adjust their hiring and salary scales, and, in turn, change household incomes and the demand for the state's goods and services, and imports. The model produces estimates of the impacts of tax reform on such key economic variables as personal income and wages, jobs, consumer and producer price indices, value added, investments, and imports and exports for 53 distinct industries.
- The HED Model records the interaction between the production costs of the state's industries and their competitiveness in U.S. and world markets. Some tax policies, for example, influence production costs and, in turn, the prices that firms charge to cover their costs for various products. Price increases typically lead to a loss of exports, which affects business volume, employment, and household income. Price increases can also raise the cost of living.

In conjunction, these two models can be used to capture the economic changes brought about by tax reform alternatives. They are the only models currently in existence that can address, in a dynamic manner, alterations in the state's costs, wages, and prices, and provide a detailed description of the state's economic linkages, which translate cost changes into effects on key economic indicators.

Approach to the Analysis

Using the DOR Tax Alternatives Model, we generated tax policies that in their first year, 1989, would result in revenue neutrality. We then entered these revenue-neutral tax policies into the HED Model to produce forecasts of the changes in the state's key economic indicators that would result in the period from 1989 to 2005.

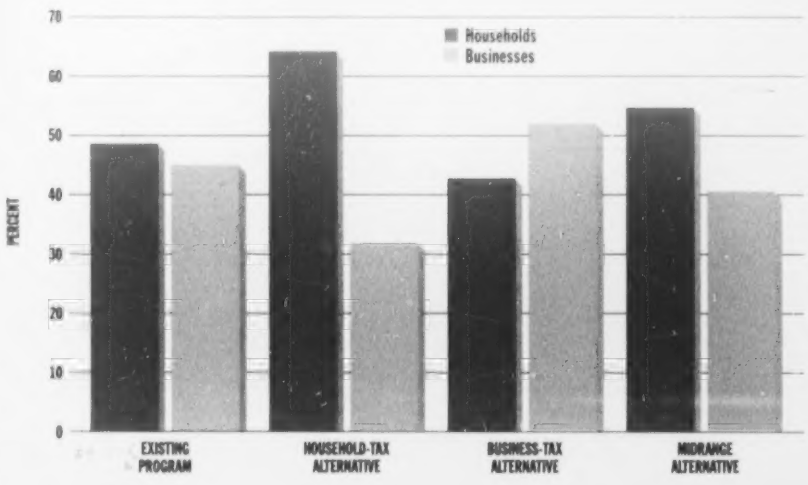
To develop the alternative tax reform packages, we adopted, in addition to revenue neutrality, tax programs that would be similar in spirit to the ones that the state legislature would most likely consider. We also defined alternative programs that would best illustrate some of the expected effects of different philosophies of taxation, such as reallocating the direct tax burden between households and businesses. In this way, even if the exact reforms that we used for the analysis differed from the reforms that the legislature would deal with, the analysis would provide general information about the state economy's likely reaction to tax reform.

Defining the Tax Reform Alternatives

A multitude of different tax types, rates, and bases could be assembled in a single reform package. Using the DOR Tax Alternatives Model and assisted by DOR staff, we developed several revenue-neutral tax reform packages and selected three of them for further evaluation.

The **household-tax alternative** consists of eliminating the B&O tax, reducing the sales tax to 4 percent (from its current rate 6.5 percent), imposing a 4.1 percent personal income tax (with a personal exemption of $1,750), and instituting a 5.65 percent corporate income tax. The Tax Alternatives Model indicated that this program moves the direct tax burden toward households, which would pay 64.7 percent of total tax revenues in 1989 (net of federal income tax deductions), compared with 52.1 percent under the current program.

Figure 2: Comparison of the Direct Tax Burden Under the Existing Washington Tax Structure and the Three Tax Reform Alternatives, 1989.



The **business-tax alternative** shifts the direct tax burden toward the business sector and away from households. The sales tax was reduced to 5 percent, with the base extended to include business and professional services, and a 5.65 corporate net income tax was added. The business share of total direct tax payments would increase from 46.1 percent to 52.4 percent, and households would bear 43.5 percent of the direct tax burden, compared with 52.1 percent under the existing tax structure. This alternative does not include a state income tax, which households can deduct from federal taxes.

In the **midrange alternative,** the sales tax rate was lowered to 4.25 percent, and the base was extended to include business and professional services. The B&O tax was cut in half, but under this alternative, firms also paid an 8 percent corporate profits tax, which would ensure that all businesses were taxed to some extent. A 3.5 percent personal income tax (with a $3,000 personal exemption) was also included. The relative share of the direct tax burden for households would be 55.4 percent, which can be characterized as a midrange alternative with regard to the allocation of the tax burden.

Once the alternative tax reform programs were developed and compared (Figure 2), we estimated the tax burden changes (net of federal income tax deductions) that would result from these programs (Table 1), and fed those changes into the HED Model. Since this model includes a household sector and 53 industries, we needed to predict the direct costs of the tax for each industry and for households. The data given to the HED Model for households were, in fact, less than the sum of the sales and income tax revenues shown in Table 1. A decrease in the sales tax makes households wealthier on a dollar-for-dollar basis, but a dollar increase in state personal income tax actually costs households less than a dollar because part of the added state income tax can be deducted from federal taxes. We estimated that, on average, 15 percent of the state income tax revenues derived from the personal income tax could be deducted from federal taxes and would not constitute an out-of-pocket expense for consumers.

Given the proportional nature of taxation, revenues grow as the economy (and the tax base) grows. We assumed that real (inflation-corrected) tax revenues would remain constant over time and would adjust for the increased demand for government services created by population growth. In the future, tax rates in the household-tax and midrange alternatives could be reduced to obtain the same amount of tax revenues.

Table 1: Tax Rate Changes for Three Alternative Tax Reform Packages
in millions $

	EXISTING RATE	EXISTING TOTAL REVENUE	NEW RATE	NEW TOTAL REVENUE
[illegible]				
B & O	variable	$ 887	eliminated	$ 0
Corporate Profits	none	0	5.65%	328
Sales Tax	6.5%	2,660	4%	1,678
Personal Income Tax	none	0	4.1%	1,541
Total		$3,547		$3,547
[illegible]				
B & O	variable	$ 887	no change	$ 887
Corporate Profits	none	0	5.65%	328
Sales Tax	6.5%	2,660	5% *	2,389
Personal Income Tax	none	0	no change	0
Total		$3,547		$3,604
[illegible]				
B & O	variable	$ 887	50% of current rates	$ 605
Corporate Profits	none	0	8%	included in B&O
Sales Tax	6.5%	2,660	4.25% *	2,046
Personal Income Tax	none	0	3.5%	902
Total		$3,547		$3,553

* base extended

The Results of the Analysis

Of the plans we considered, the household-tax alternative produces the greatest payoff (Figures 3 and 4). The distinctive features of this alternative are its substitution of a personal income tax for nondeductible sales taxes and a corporate income tax for the B&O tax, which would lighten the tax load on the state's businesses. Although the household-tax alternative entails a shift of the direct tax burden toward households, households benefit the most—in terms of total and per capita disposable personal income—once the economic interactions work through the economy. The loss of real disposable income and employment, due to increased taxes, occurs during the first or second year of the program, but the state's gradual increase in competitiveness results in net gains.

The household-tax alternative increases the state's real per capita disposable income by up to 1.4 percent (in 1988 dollars) in the year 2005, from a projected level of $104 billion without tax reform. Given the increased tax base that would result from the household-tax alternative over time, small reductions in tax rates may be feasible.

The business-tax alternative, which shifts the direct tax burden toward the state's businesses and away from its households, has effects that are quite different than those of the household-tax alternative. The impacts of the business-tax alternative include increased production costs, higher inflation, and decreases in employment and real disposable personal income.

The midrange alternative, which is nearly neutral in terms of the direct tax burden, takes advantage of federal tax reform by including a personal income tax and reduces business costs, while ensuring that all businesses pay some tax. The ultimate economic impacts of this alternative, however, are not as beneficial as those of the household-tax alternative, principally because the midrange alternative produces lower cost savings for the state's businesses. Real disposable personal incomes, both total and per capita, are increased only slightly by the midrange alternative; again, the benefits to households correspond closely to those for businesses.

The advantages to Washington's businesses are substantial under the household-tax alternative and slight under the midrange option. The state's primary export base—manufacturing—benefits from reduced pro-

Figure 3: Impacts of Alternative Tax Reform Programs on Washington's Employment

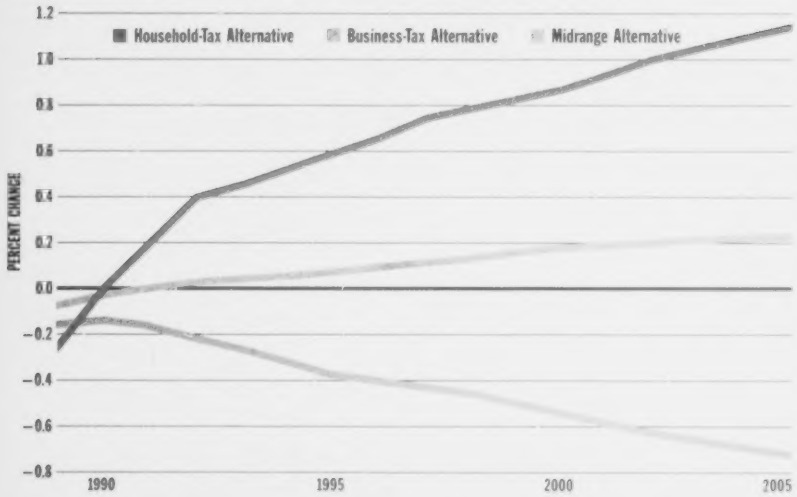
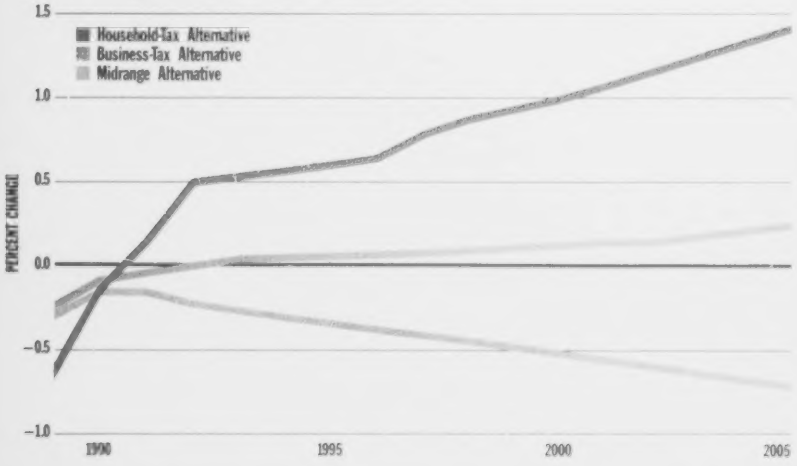


Figure 4: Impacts of Alternative Tax Reform Programs on Washington's Per Capita Real Disposable Personal Incomes



duction costs, which, in the long term, translate into increased exports. Added exports and disposable income create additional demand for goods and services, which further boost state employment. The service, trade, and manufacturing industries enjoy the bulk of the employment benefits for the first alternative. The business-tax alternative, in comparison, harms households as well as businesses, even though the direct tax burden is shifted away from consumers.

Through the analysis of the three tax alternatives, we noted that the household-tax and midrange alternatives improve Washington's economy after a short transition period, which is strong evidence that the existing tax structure is an inefficient one that can be bettered. Although the predicted gains may seem proportionally small—a maximum of 1.6 percent for the household-tax alternative—the economic policies that achieve gains of this size are considered successful.

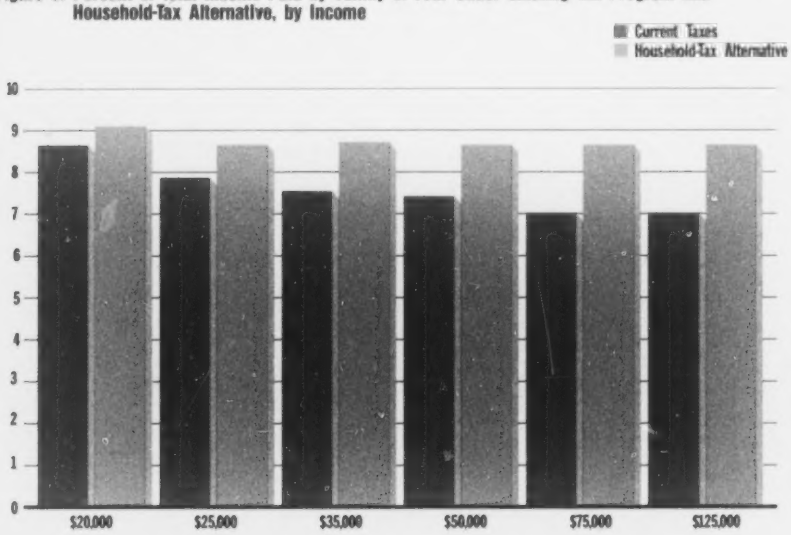
The economic welfare of the state's residents, represented by real disposable personal income in the household sector, is inextricably tied to the fortunes of the state's business sector. This may seem an obvious point, but some critics have censured policies to assist the state's firms and fail to recognize that increases in business income ultimately end up in the pockets of the state's residents. Although Washington corporations pay much of their dividends to out-of-state shareholders, a much larger proportion of Washington businesses' gross income is distributed to the state's residents in the form of wages and salaries. The alternatives that shift the direct tax burden away from businesses and toward households provide the greatest benefit for the household sector. The business-tax alternative makes the state's industries less competitive, and households suffer. It is misleading, then, to focus solely on the direct tax burden without considering the various economic interactions.

The direct loss to the household sector from the increased taxes is softened by the resident's ability to deduct personal income taxes and by the associated reduction in the sales tax. Out-of-pocket costs to households are 15 percent less than the state personal income revenue increase. In effect, these out-of-pocket savings are redirected to the business sector by reducing or eliminating the B&O tax, or by reducing the sales tax. The state's industries, given the resulting drop in costs, become more competitive in their export markets and, in turn, produce net increases in economic welfare.

Given these positive impacts, the electorate's stiff resistance to the personal income tax is not easy to understand on purely economic grounds. It may be that this resistance is related to the anticipated headaches of filling out another set of tax returns or to the fear that tax reform is really a tax increase. It may also be true that the electorate believes that the income increases provided by a more efficient tax structure accrue primarily to others, such as the people who move into the state to fill new jobs.

Would existing households or new households benefit the most? On the basis of this analysis, we can project that real per capita disposable income will increase by up to 1.4 percent under the household-tax alternative. Much of the increase can be attributed to a 3 percent to 4 percent increase in real average wages. Although some state residents would probably not achieve net gains, increased per capita incomes indicate that, on average, both existing and new households would probably be better off with tax reform. The midrange alternative does not achieve noticeable per capita income benefits and would, for that reason, probably be more difficult to sell to the electorate.

Figure 5: Percent of Total Income Paid by Family of Four Under Existing Tax Program and Household-Tax Alternative, by Income



The economic growth stimulated by the household-tax alternative—and, to a lesser extent, the midrange alternative—would also increase the tax base, which would allow actual tax rates to fall somewhat over time and yield constant real tax revenues. We assumed that real tax receipts, adjusted for population growth, would remain constant while the tax base grew, so tax rates were projected to fall slightly. This projection may seem similar to that embodied in the "Laffer Curve," embraced by Ronald Reagan and Jack Kemp, which was the target of George Bush's "voodoo economics" criticism in the 1980 Republican primary race. In fact, there is a critical difference: the tax reforms we've considered do not entail overall tax cuts or increases. They simply represent a reallocation of the tax burden to capitalize on federal tax reform and use the savings to assist the state's industries. The business-tax alternative, in comparison, does not take advantage of opportunities presented by federal tax reform and, instead, creates a more substantial drag on the state's economy, raising the possibility of tax rate increases.

The aspect of equity is a particularly sensitive one, given that most low-income households, which do not itemize, would not be able to deduct the state income tax from their federal tax obligations. The reduction in the sales tax would provide some help, in terms of the direct tax burden, to low-income households. The household-tax alternative would tend to reverse the current tax system's regressive direct structure by placing a heavier proportional tax on very high income households (Figure 5). Employment and wage rate forecasts produced by the HED Model for 96 occupations indicated that the increased real wages derived from the household-tax alternative are slightly skewed toward the better-paying occupations, but this alternative does not appear to significantly affect the real after-tax income distribution.

The Competitive Advantage of Tax Reform

Our predictions of the overall impact of tax reform on the Washington economy indicate that tax reform, if it is carefully designed, can produce noticeable economic improvements. Additional research should investigate issues such as the actual tax incidence and equity, as well as evaluate other tax reform alternatives.

The reader may notice, for example, that the net gains from tax reform yielded by the household-tax and midrange alternatives rest to a great extent upon the resident's ability to deduct state personal income taxes. A reasonable question to ask is whether a net gain would be realized if tax reform simply shifted the direct burden toward households, without providing consumers with the relief of federal tax deductions. Such a shift could still benefit the business sector, but would such benefits outweigh the direct tax loss to the household sector? To what extent should tax policy be aimed toward directly aiding businesses and making them more competitive, given that tax breaks for businesses usually come at the expense of consumers?

In the course of our background research, we experimented with a program that included a transfer of $500 million of the direct tax burden from businesses to households. The HED Model indicated that the initial effects on real disposable personal income would be negative, but, within a few years, the state economy, including its households, would begin to experience relatively small income gains as the state's businesses became more successful. In sum, the deductibility issue is an important driver of the positive impacts of the household-tax and midrange alternatives, but making the state's businesses more competitive is also an element of tax reform's success.

Finally, tax reform alternatives can be designed in any number of ways, and it may be possible to formulate a program that would yield higher economic benefits than those of the household-tax alternative. Since deductible personal income taxes are the source of much of the benefits of this alternative, an even higher personal income tax rate would allow further reductions in the sales tax or a lower corporate profits tax, and still permit the elimination of the B&O tax. The greatest drawback to this strategy is that a high personal income tax is not likely to be politically feasible.

Washington State has the opportunity to reorient its tax base to capitalize on the federal deductibility of state income taxes and to provide tax relief to business. It may be that many other states will eventually revise their tax programs to achieve the same ends, thereby neutralizing Washington's competitive advantage from tax reform. If this state chooses not to implement tax reform, and other states do so, Washington would suffer by comparison.

David C. Clark is a research specialist at the Battelle Human Affairs Research Centers in Seattle. Kathleen S. Morse is a research assistant. *The authors wish to express their gratitude to Rick Peterson, Donald Gutmann, and Stan Woodwell of Washington State Department of Revenue for providing detailed information from the state's tax data base and advice on tax programs that would be most relevant for analysis.*

The West, Garbage, and the American Dream

by W. Ed Whitelaw, Ernest G. Niemi, and Terry Moore

I have married my hands to perpetual agitation,
I run, I run to the whistle of money.
Money money money
Water water water

—Theodore Roethke, *The Lost Son and Other Poems*

It is often difficult for many of us in the Pacific Northwest to think clearly and to some purpose about the differences between California's economy and our own. Fear and envy of the colossus to the south can cloud our intelligence and leave us proclaiming, "Don't Californicate Washington!" or "Oregon is Open for Business!" instead of learning what we can from a comparison of economic realities.

The differences between the economies of the two regions are real and substantial, but nowhere near as absolute as we tend to draw them, nor as daunting as our bumper stickers would seem to imply. For one thing, all of us in the Pacific Northwest share in the great strength of California's economy. Trade with California accounts for a quarter to a third of the Pacific Northwest's total with other regions and nations. The Seattle-Tacoma area is driven by a northern version of the same forces—large aerospace and defense industries, foreign and domestic trade, and peculiar geographic and climatic advantages—that drive much of California's urban economy. Even those parts of Washington, Oregon, and Idaho that differ most from California share the same advantage of location on the Pacific Rim, where the economic action is likely to remain strong for a long, long time. They share, too, the constant thrust of westward migration, and the economic activity that comes with it, and the natural resources sufficient to support a rich variety of development.

In fact, a cautious examination of the disparities between the two regions often reveals a distinction that, once understood, we might turn to our own advantage. Consider, for example, per capita income. Incomes, when measured solely in dollars, are higher in California than in the Pacific Northwest. In 1987, the most recent year for which there is a complete set of data, California enjoyed a per capita income of $17,661, while Washington had $15,444, Oregon $13,887, and Idaho $11,820. Even after accounting for differences in the cost of living, the differences in income and wages persist.

Do these disparities mean that Northwest-

erners are poorer than Californians? Not if you recall that the level of wages in a labor market, whether in San Francisco or Seattle, results from the interaction of supply (from workers) and demand (from firms).

Environmental and Cultural Amenities

If firms find a certain location more attractive than households do, wages in that location will be higher. San Francisco—the bay and its robust metropolitan economy—offers Bay Area firms lower shipping and production costs; these companies can pay higher wages and still remain competitive with firms in other regions. Workers and their families, in general, seem to find Portland more attractive than firms do, so the labor supply dominates the market, and, as a consequence, wages are lower. (This is not to say that firms don't like Portland—they do. Households simply find the city more attractive.)

When workers don't have ready access to high-quality environmental and cultural amenities, they require higher wages as compensation. California's mountains and beaches, museums and great theaters are estimable, but its freeways make reaching those attractions an epic undertaking. Residents of the Pacific Northwest, in comparison, seem to accept their ready access to the region's environmental and cultural amenities as part of their real income—a supplementary paycheck denominated in fish, trees, birds, and clean air and water, rather than dollars and cents. In return, firms in the Pacific Northwest enjoy labor costs that are not as high as they would be if this supplementary paycheck were to disappear, and this gives Northwest companies cost advantages relative to their competitors in regions where the amenities are not as attractive. Or, from another perspective, people live here because they like it here, and, by doing so, they form both labor and consumer markets that generate a foundation for economic growth throughout the region. Take away these amenities—or increase the disagreeable aspects—and this foundation begins to crumble.

In planning the Pacific Northwest's economic development, then, we must not lose sight of that strength which is our own. Trying to mimic the accomplishments of an economic giant like California can turn us into a parody of what we hope to become. We need not look like an economic David stumbling into battle wearing Goliath's armor. In the Pacific Northwest, we have our slingshot and at least one good-sized pebble as well: the quality of our environment—both what it is in fact and what it is widely perceived to be. We can demonstrate our strength by recognizing and protecting this asset, by acknowledging its implications for economic planning.

One hundred years ago, a crossroads on the way West was marked with a sign reading "Oregon Trail" to the north and showing a pot of gold to the south. Legend has it that only the pioneers who could read followed the trail all the way to Oregon.

—The Oregon Historical Society

A region can waste its environmental resources by using them up precipitously or by trashing them before their benefits can be realized. One of the ways in which we can trash our environment is with trash. Waste management—garbage—is simply an unpleasant topic for most of us. We don't like to think about it. Yet waste management must be at or near the top of the list of problems every Pacific Northwest economic planner wrestles with. Other regions may dignify the garbage man with the title sanitary engineer and forget about him; in the Pacific Northwest, we can't do that. We must remember that we have a choice: the garbage man, the one who keeps our marketable environment and its products as pure as we claim them to be, can be our savior or he can be our nemesis.

Like other major cities across the United States, Seattle and Portland are exhausting the landfills they now have. The Puget Sound's toxic chemicals and the Willamette Valley's field burning kill both wildlife and humans. Radioactive waste at Hanford and nerve gas at Umatilla are regional sores that will require expensive medication. Hanford has the biggest volume of nuclear waste in the United States, and two of the four states in the union with the largest amounts of high-level nuclear waste are Washington and Idaho. (South Carolina and New York are the others.) So far, we've avoided being branded by the stigma of Hanford, and we've eluded protracted garbage battles that stay in the news. But pray we don't ever have our own garbage barge or some similar event that lingers on television for weeks and creates a new popular image of us. The potential is real, however, and we must acknowledge that either waste management is big business in the Pacific Northwest or other businesses are less likely to be.

Lessons to Learn

In the Northwest, we have three worries, three lessons to learn. First, we must calculate more carefully the actual costs of dealing with waste, and we must heed our calculations. We must, second, rid ourselves of phantom garbage—the waste that people imagine to be threatening our environment—as well as the waste that is actually here. Third, and most important, we must think before we dump.

Specific decisions about matters of waste disposal are governed quite properly by the bottom line. Can our public agencies afford to remove and neutralize some threatening toxin, to transform what has been waste into some newly usable product, to estabiish a landfill, a recycling center, or a collection system? A practical executive would say, "Sure, if the cost is not too high. Otherwise, forget it." But in the Northwest, waste is not something we can forget. There are costs to be borne if we choose to dispose of it, and there are other costs to be borne if we choose not to. We simply must learn to recognize both of these eventualities when we make our choices, and we must, in particular, realize that not disposing of waste properly will jeopardize the very things that make this a desirable region in which to live.

Hanford provides an example of just how difficult this cost accounting can be. The

price tag for cleaning up Hanford's wastes is staggering: the most recent estimates from Washington's Department of Ecology total $45 billion. Not surprisingly, no one has assessed the cost of *not* cleaning up the waste. The task of devising that estimate would be formidable. One would have to begin by calculating the value of Hanford's impact—both real and perceived—on the products (apples, wheat, and wine) and services (tourism and medical treatment) that would likely be affected by the continued, threatening presence of the waste. How would Washington's apple crop (wholesale value in 1986, $750 million) fare against nonnuclear New Zealand's harvest? And, if the U.S. Department of Energy fails to prevent Hanford's waste from breaking into the Columbia River, what would become of sailboarding at Hood River, one of the Pacific Northwest's brightest examples of economic development?

If the gorge survives that downstream glow, can it also survive the upstream flow of solid waste from Portland to eastern Oregon? Opposition from landowners near the proposed new metropolitan landfill and competing offers from waste disposal firms in the eastern Oregon desert convinced Portland's Metropolitan Service District (Metro) to sign a contract in March 1988 to send its waste, probably by barge, up the Columbia to a private landfill in Gilliam County.

On the credit side of this garbage balance sheet, Portland gets its landfill and in a distant location, where the dry climate and sparse population reduce the overall risk of contamination and exposure. On the debit side, the city's decision to send its waste to eastern Oregon will cost the ratepayers in the metropolitan area an extra $5 million to $15 million per year—in addition to increases of 150 percent to cover the costs of closing the existing landfill. Despite extensive and expensive safeguards, which made the proposed local landfill arguably as safe as the one in eastern Oregon, Metro chose to spend additional millions of dollars per year to move wastes away from those who perceived them as harmful. Phantom garbage can be as much of an impediment to economic development as real garbage, causing us to throw immense sums of money at problems that have more potential impact than measurable impact.

People who live in areas that are thought to be environmentally unpleasant or unsafe suffer the same kinds of economic damage as those who reside in neighborhoods that actually are despoiled or threatening. In both instances, property values decline until popular perceptions change and regentrification restores them. Health-care costs increase for physical and mental illness. The toll is the same whether you live in Love Canal or only think you do. Even safe and sound products can suffer in the marketplace if their origin is thought to be ominous. The ghostly presence of Hanford may be more damaging to our economy, as the result of stigma, than it actually is.

The containers of Portland garbage barging through the Columbia Gorge may be indistinguishable from other river traffic, but even an innocuous accident will taint Oregon's attempts to create a new riverfront recreation area to attract tourists. We laughed at Long Island's garbage barge; will others laugh when we have a fleet of them?

Portland Metro's choice illustrates the interrelationship between the garbage balance sheet and phantom garbage—between the quantifiable costs of construction and operation and the intangible costs that people perceive. Metro's decision is laudable, for it showed a willingness to incur greater quantifiable costs to reduce the intangible ones. But Metro may have overvalued the intangible costs of a local landfill to its constituents and undervalued the intangible costs of phantom garbage on the move. Will people looking at the Northwest credit us for having solved our garbage problem, considering that most East Coast states haven't come close, or fault us for putting the Columbia River at risk and increasing our waste disposal costs for no apparent reason? Should we be prepared to pay dearly for the safeguards that will, either in fact or in public opinion, protect our environment from real or perceived degradation?

Who Should Decide?

Traditionally, decisions concerning the generation and the disposal of waste have been the province of specialists, of engineers and planners who typically make their recommendations based on narrow criteria. They look primarily at the facility itself and give relatively little attention to wider economic issues, such as the plant's impact on groups within the community and on the community's economic future. The scientists and generals who built Hanford had a war to win and couldn't take the time to plan past the 1940s. The plant managers and financiers who maintained Hanford had a new industry to support and didn't look beyond their own immediate interests in the 1960s and 1970s. Those of us who must live with Hanford in the 1980s and on into the next century would like to have the opportunity to reconsider some of the decisions that the specialists made for us, for it appears that Japan is recovering more quickly from the weapon we made at Hanford than we are from having made it.

We are learning that we pay a price for a narrowly professional approach. The experts who ignore the impacts of their decision making on a community can disrupt the entire community's political and economic stability. Households and high-growth firms don't want to locate near a dump or be served by a potentially polluted water supply. Nor do they want to locate in a community typified by vitriolic controversy over waste disposal. Individual communities—or an entire region—can create immediate and lasting impairment to their economic growth by ignoring impacts of waste in fact or waste in perception.

Economic strategists argue that we should concentrate on our strengths, not our weaknesses. The Pacific Northwest, arguably more than any other region in the United States, benefits from the perception, if not the reality, of its unspoiled environment. Some in the Northwest dismiss such an argument as simply testimony for family vacations. Others feel a bit smug that our environmental activism and populist politics will protect us. But if ignorance and complacency yield ugly reality and Johnny Carson can get laughs when he tells Columbia River garbage-barge jokes, talented workers who value environmental amenities will not move here, and many already here will leave. And so will the firms—high-tech, low-tech, manufacturing, and services—that we count on. In short, our economic future will dim and our envy of California will continue to cloud our intelligence. Without our amenities, we will lose our competitive edge. Our incomes will be lower, our production costs higher, and our future less enjoyable.

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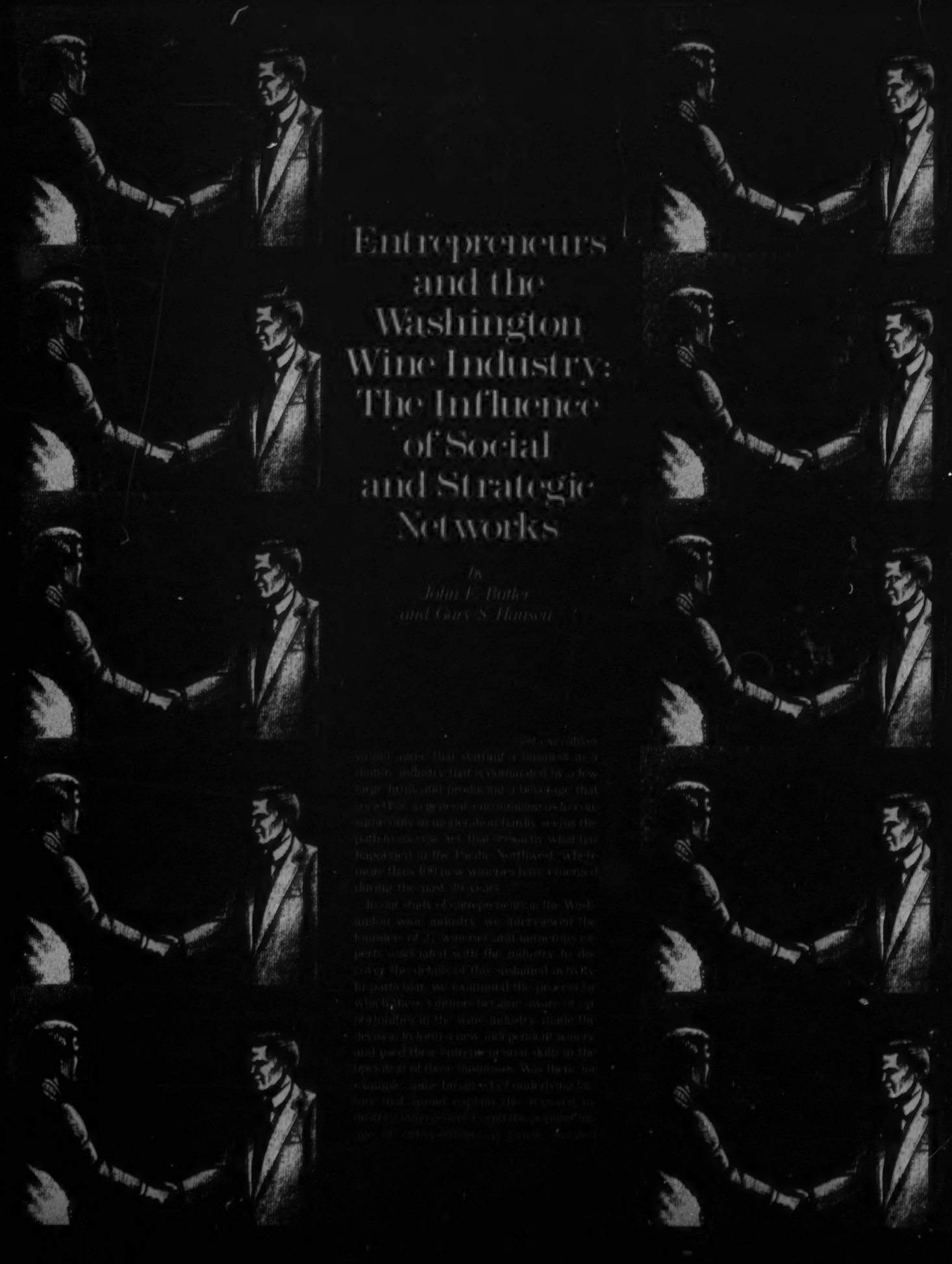

Entrepreneurs and the Washington Wine Industry: The Influence of Social and Strategic Networks

by
John F. Barker
and Gary S. Hansen

Most executives would agree that starting a business in a mature industry that is dominated by a few large firms and producing a beverage that society is in general condemning is the quickest way to bankruptcy. Hardly seems the path to success. Yet that is exactly what has happened in the Pacific Northwest, where more than 100 new wineries have emerged during the past 20 years.

In our study of entrepreneurs in the Washington wine industry, we interviewed the founders of 25 wineries and numerous others associated with the industry to discover the details of the unfolding activity. In particular, we examined the process by which these citizens became aware of opportunities in the wine industry, made the decision to form a new, independent winery, and used their entrepreneurial skills in the operation of these businesses. Was there, for example, some personal underlying factors that would explain the creation of nearly a winery a week? Could the explosive

adventurers be applied to the men and women we'd met?

The Washington wine industry can be characterized by the presence of founder-entrepreneurs, the existence of well-developed, efficient social networks, and the establishment of strategic networks within the industry. Since local entrepreneurs—rather than California- or foreign-based vintners—have played an important role in the emergence of Washington wineries, the mechanism by which they are attracted to the industry is part of its essential structure. We found that the social networks of these men and women—which consist of friends, relatives, and business associates—represented the primary avenue for the dissemination of restricted information about new opportunities. Only through interpersonal contacts did these entrepreneurs gain access to knowledge of the critical factors in the wine business—even through this information was theoretically available to all. They also relied on their existing social networks to generate, support, and sustain their desire to start a winery.

In addition to social networks, founder-entrepreneurs were supported by organizational networks—a strong set of intraindustry linkages. This ability to talk to each other allowed the wine makers to share production assets, marketing programs, distribution channels, and agricultural knowledge in a highly efficient manner to achieve common goals. The ongoing growth of the wine industry may, in fact, be the result of this network's positive impact on the competitive positions of all wine-making firms and on regional demand.

Characteristics of Useful Networks

Each social network has three common characteristics: network size, the relative centrality of each person within the network, and his or her direct and indirect links to other members. While the size of the system is important, it is not necessarily better to be the central figure in a large, dense network. Size can lead to inefficiency and high overhead or maintenance costs, density might induce "group think," and centrality could produce information-processing overload rather than business creation. The size of a social network determines both the number and the width of information avenues. Network size is measured in both direct and indirect terms, and includes close contacts as well as the friends of friends. At one extreme, there could be the entrepreneur who has numerous social contacts but little time for any one person, and, at the opposite end, the entrepreneur who needs relatively few outside relationships to pursue his or her interests. For a firm, network size can enhance the introduction of new products by increasing product diffusion. The wine industry entrepreneurs we studied expressed a clear preference for large social networks.

An individual who occupies a central position in the social network is likely to receive information faster and more accurately because it passes through fewer intermediaries. People on the fringe of the network are likely to inherit news that is distorted or time delayed. Given that entrepreneurs act on their perceptions of inefficiencies in the marketplace, their position relative to the acquisition of new information may be critical to success. The identification of superior growing conditions, for example, could make a decisive difference to the producer of premium wine. For the vintner who caters to a more popular segment of wine drinkers, the early detection of changes in consumer trends could be a significant factor. Washington wine entrepreneurs, in general, hold central positions in their social networks.

In addition to position within a network, the percentage of an entrepreneur's ties that are direct can play a role in his or her good fortune. Take, for example, two executives; both entrepreneurs might be centrally positioned in a social network, but one maintains direct access to a large number of associates, while the other uses a gatekeeper to control access. The executive who allows wide access will have a higher percentage of direct ties. Although these ties will be weaker in nature (because the executive has less time to spend with each individual), this very fact ensures that some of the information transmitted will be new and may express a different, and perhaps competing, attitude. The executive who employs a gatekeeper limits access to only those people who hold the same views and opinions and who act simply as reinforcing agents. No new information is transmitted.

In general, the individuals we studied have relatively large social networks, occupy central positions in them, and maintain a large percentage of direct ties to magnify entrepreneurial performance. Men and women with these social networks are constantly exposed to new ideas, which, in some cases, act to challenge their own views. This questioning of one's belief in the "predictable order of things" is often entrepreneurially useful.

Networks in the Washington Wine Industry

There are 78 bonded wineries (as of September 1988) in Washington State, and the majority of them are independent producers that are still managed by the founder-entrepreneurs (Figure 1). We collected data on these vintners and their social networks before the decision to start a winery and then examined the entrepreneurs' use of their social networks to obtain assistance in the early stages of their winery's operation. We categorized the linkages that entrepreneurs established with other wineries and the ways in which these organizational contacts were used to achieve advantage in the marketplace.

The social networks of founder-entrepreneurs are characterized by the number of social contacts (the size of the network) and by the nature of these social relationships (the position of the entrepreneur within the network). Three categories of networks emerged.

Diffused networks. Entrepreneurs in these networks typically have both peripheral and central positions in a variety of networks, but they almost always occupy a peripheral position in their wine-related networks. One individual we met was centrally positioned in several cultural, church, social, educational, and recreational activities, and often acted as a key link between networks. Wine was his lifelong interest, but, in a social network related to wine, he was only in a peripheral position.

Twenty-three percent of the entrepreneurs had large, diffused social networks, and, because of the size of their networks, they gained information about a number of business opportunities. Entrepreneurs within this type of network are, we discovered, very likely to start a business, and, for most of these executives, the winery was not the first business they had started.

These people were very conscious of the value of social contacts and the role contacts played in their decision to enter the wine-making industry. A friend's suggestion was often the impetus for the start-up, and, in one case, the entrepreneur began arranging financing for the winery the next day. In general, these men and women had an

interest in wine from a consumer standpoint, but they had not been engaged in an active search specifically directed toward opening a winery.

Directed networks. These entrepreneurs are peripherally positioned in several social networks, but are always centrally positioned in the social network related to wine. One man in our survey had a highly focused and well-developed network with respect to wine, but also maintained an active presence in social networks related to church, children, neighborhood, and profession.

Founder-entrepreneurs with large, directed social networks represented 46 percent of the sample. These individuals had felt a long-standing desire to enter the wine business, and their selective social networks reflected this aspiration. Their social networks were often as large as those of entrepreneurs with diffused networks, but contained a greater percentage of friends and acquaintances who were capable of providing wine-related information. For these vintners, social activities often centered around wine, and their networks were more restricted in the range of interests covered.

These men and women, when making the decision to start their own business, seemed more likely to start a winery than any other business. It was their deep-seated desire to enter the wine industry that affected their receptivity to information.

Highly focused networks. In these social systems, the entrepreneur occupies a central position in a single network, which is focused almost exclusively on wine-related topics. One person, for instance, developed relationships only with individuals who were involved in wine tasting, hobby wine making, grape growing, and the scientific activities associated with wine.

The remaining founder-entrepreneurs, 31 percent of the sample, had smaller and more highly focused social networks. They developed social networks that provided as much wine-related information as the other types of social networks, but these executives were less receptive to other types of business opportunities. They constructed their networks in a more deliberate way, with an awareness that a winery was the only business they would be likely to start. Additionally, this group focused its networking activity on specific segments of the industry, such as the wine-making process, grape growing, or sales. This narrower focus left them with fewer alternatives for information when problems unrelated to their personal strengths arose.

Most of these men and women acknowledged a long-standing desire to open a winery. Many had experience as hobby wine makers, and several had actually moved to Washington for the express purpose of starting a winery. In general, they saw wine making as both a business and a lifestyle.

Networks in the Start-up

Founder-entrepreneurs seldom used friends and associates from their social networks for professional advice during the initial stages of setting up the winery. Accountants were seldom consulted, and bankers were usually omitted from the start-up phase. Even the complicated process of securing federal and state bonding was, in most cases, handled without contacting attorneys from within their social circle. Some of the entrepreneurs, however, used their social networks —friends, members of the local football team, residents of the local retirement community—as a source of labor. In one case, the existing network was tapped for financial support and for ongoing managerial talent, but, in general, the vintner's social network wasn't particularly important to the efficient functional operation of the business during the start-up process.

Strategic Networks

Entrepreneurs were not isolated when it came to finding sources of production equipment or grapes, or identifying channels of distribution. Their need for this information led them to contact other wineries, and these between-winery contacts served as the first step in the development of a strategic network. The creation of wine-growers associations, membership in the Washington Wine Institute, contacts with the universities that specialize in grape-growing and wine-making technology, such as the University of California at Davis, and magazines, such as *Wines and Vines*, strengthened between-firm contacts and the transmission of pertinent information.

The approaches taken by the founder-entrepreneurs to develop these strategic organizational networks reflected the same degree of diversity seen in the development of their social networks. We identified five specific types of firm cooperation that are characteristic of strategic networks: intraindustry cooperation, cooperative efforts with grape growers, participation in professional organizations, the development of marketing and sales ties, and the development of reputational links with other wineries (Table 1). While only five of the 27 wineries made use of all the possible marketing and production linkages, 26 wineries had established at least one of the linkages needed to build a strategic network.

Intraindustry cooperation is the most basic way Washington wineries can share technical information related to grape growing and production, and begin to achieve the advantages of scale that are common

Figure 1: Bonded Wineries in Washington State, September 1988

to producers such as Gallo. One group of four wineries on the Olympic Peninsula has developed a marketing program to attract visitors interested in wine tours and tasting. The Yakima Valley Grape Growers Association, which consists of 17 wineries, promotes the wines produced in that region. In the Walla Walla area, vintners have organized an annual wine celebration in conjunction with the city's popular hot-air balloon festival. In these ways, entrepreneurs are able to increase retail sales at the winery, avoiding some of the costs associated with distribution, and reduce their promotional expenses by advertising as a group. This type of cooperation also enhances Washington's competitive posture with respect to wineries from other regions and countries.

The entrepreneurs were less intent on establishing links with grape growers. The exceptions were the wineries that produced high-priced, super premium wines. Wineries that had won numerous awards for excellence emphasized the nature of the grape as a key factor, and these producers sometimes deliberately paid growers above-market prices to ensure a constant source of the highest quality grapes. In other cases, entrepreneurs worked with growers to develop high-quality, less-common strains of grapes.

The Washington Wine Institute (formed in 1983) and the Washington Wine Commission (created in 1987) serve as the formal lobbying and marketing segments of the industry. Small wineries, which sell a high percentage of their output at the winery, are less interested in these institutions. The small producers generally acknowledged, however, that although the short-term benefits of marketing wine outside the state of Washington went to the larger wineries, the long-term benefits would be advantageous for both sets of producers.

Some entrepreneurs saw the use of networks as a means for developing marketing channels as a way to dispose of their current output, while others sought to build these networks for future use. Wineries operated by founder-entrepreneurs who had large social networks or who had marketing backgrounds seemed more focused on the future than on the present. These vintners recognized that they were putting more effort into the marketing area than was currently required. They indicated, however, that this labor was part of their growth strategy: they recognized the need to have the sales network in place before expanding production. These wineries generally had wide networks of domestic distributors and exported their products to other states and countries.

Table 1: Washington Wineries and their Organizational Linkages

	PRODUCTION LINKAGES		MARKETING LINKAGES		
	Intraindustry cooperation with other wineries	Cooperative efforts with grape growers	Active participation in professional organizations	Development of strong distributional or retail linkages	Development of reputational linkages with other wineries
Percentage of firms engaged in activity	85	63	59	67	33
Actual number of firms engaged in activity	23	17	16	18	9

The existence of reputational links in the entrepreneurs' strategic network was not one we had expected. A vintner with a premium Cabernet sauvignon, for example, discusses his wine's quality in terms of similar, well-known wines produced by others in Washington. In this way, each of the wineries is able to take advantage of the combined effect of reputation. This is a particularly effective mechanism for premium wines at the high end of the price spectrum, for these wines often sell out. By linking types of wines, the vintners hope to encourage buyers to shift to another Washington wine—rather than a non-Washington brand—when they can't find their preferred label on a store's shelves.

Challenging the Status Quo

The prevailing popular view of the entrepreneur as an adventurous, independent executive was not the individual we encountered in the wine industry. Our study of the underlying dynamics associated with the wine industry's growth suggests that entrepreneurs aggressively build and maintain social networks. These networks feed them the information they need to forecast entrepreneurial opportunities. The vintners who participated in our project didn't perform in a solitary or isolated manner, but as individuals who are centrally positioned in well-developed social and strategic networks.

It is surprising that the social networks aren't more fully exploited for technical advice during the start-up phase. The ability of founder-entrepreneurs to construct networks at the organizational level, however, indicates that they recognize the value of networks and understand the role between-winery linkages can play in the industry's development. Networks can reduce a winery's disadvantages with respect to size, product recognition, and managerial expertise. In this way, wineries are able to benefit strategically to the degree they can build and maintain organizational networks with their regional competitors. Whether at the individual or firm level, the flow of information is enhanced through links to other individuals and firms, and these are the links that fledgling entrepreneurs and their wineries should develop.

Social contacts and linkages in entrepreneurial activity are a source of new information and opportunities. They can provide a challenge to the status quo. The breadth of an entrepreneur's network facilitates the search for information, increases the probability for success, lessens the cost of knowledge, and reduces risk during the start-up.

Large organizations that are outside the wine industry and yet seek to promote entrepreneurial behavior should encourage their managers to pursue network-broadening experiences similar to those of the vintners. Specifically, managers should maintain lines of communication with their associates in other areas, participate in professional and industry associations to establish and maintain contacts with other professionals, foster links with academic institutions, and engage in charitable and public service activities that will provide a wider array of environmental information, as well as new ways of interpretation. ■

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PACIFIC NORTHWEST Executive

A Regional Business Publication of the University of Washington Funded by Seafirst Bank

University of Washington
Graduate School of Business

Vol. 5, No. 2 April 1989

Commentary

Adding Computers to Executive Desktops

Executives and information systems professionals alike are now examining the potential—and the pitfalls—of executive computing. A number of Fortune 1000 firms, including Avon Products, Boeing, Gillette, Monsanto, R. J. Reynolds, Xerox, BP America, ConAgra, Bristol-Meyers, American Cyanamid, and the Mead Corporation, have completed their examinations and decided to add computers to their executives' desktops.

The purpose of these systems is to provide timely information on corporate and competitive performance to the executives responsible for making key day-to-day operational decisions. What has changed since the days of management information systems in the 1960s are the software tools and computer interfaces available to deliver the information to the executive desktop. The new software packages can combine text, graphics, and numbers in formats that can be customized to suit the information needs of almost any executive.

But how do the intended users of this technology feel about this specialized attention? Do executives even want to be the hands-on users of today's technology? In 1987 Edgar H. Schein, a professor at the Sloan School of Management at the Massachusetts Institute of Technology, and Diane D. Wilson, a research associate, surveyed chief executives at 71 Fortune 500 companies and found that 57 percent of them saw great potential benefits in the new computer technology, but also anticipated major problems in installation, including hidden costs and organizational resistance. An additional 22 percent were extremely positive, and 19 percent were ambivalent. Only 2 percent seriously doubted the benefits of executive computing.

Robert Wallace, the president of the Phillips 66 Company, recently said, "Companies that are reluctant to move electronic information into the executive suite are naive. Their reluctance is going to be a significant limitation on their managerial and competitive ability in the 1990s."

In the companies where executive computing is in place, senior executives have used their systems for a variety of activities: to review periodic revenue-profit figures and economic forecasts, to assess systemwide on-time performance, to monitor output and compare competitor profitability and marketing measures, to examine recent claims activity, to install companywide electronic mail communications, to analyze business plans and long-term sales trends, and to query human resource databases for succession information.

Yet, for all those who adopt executive computing, there are those who are rebuffing its advancement. The 57 percent in the MIT survey who cited "hidden costs and organizational resistance" could well have been thinking of the influence of traditional "power brokers" and "information merchants" within the firm. These managers know all too well that information is power, and they are reluctant to give up that power without a fight. The other reasons for resistance include the impact of the firm's culture on the status implications of hands-on executive use and effective management style, and the painful realization that the firm's current systems are simply not capable of providing the information required for executive computing without a major overhaul or expensive, inefficient data reentry.

All of these problems can be solved—but only by a firm whose executive management assigns a high priority to information access and organizational change. Too many times, it's more expedient simply to let the status quo prevail.

Earlier executive computing efforts were, unfortunately, often cumbersome and prone to disuse through sheer difficulty. Such failures are lamentable since a system that offers even a modest time savings to senior executives lends itself to easy justification in terms of the high value of the executive's time. The key is ensuring the system's timeliness, accuracy, and relevance of information to senior management. Since almost any CEO can make a phone call and get the answer to a question, the new system, to add value, must be well-planned and prioritized to succeed. There is little payoff in making our executives inefficient manipulators of spreadsheets. The challenge is to create a computing environment that has the ability to stimulate new management insight and lead to a quantum improvement in the firm's strategies and results.

Executives who believe that executive information systems could help their firms should do two things. First, they need to assess the firm's executive information requirements and the sources of that information. Then, using a must-want framework, they can determine the size and scope of the overall challenge, the company's logical modular groupings, the priorities that exist among modules, and any general time-cost parameters or constraints. They should, second, pick a high-priority module for which data access is relatively straightforward and use that as a prototype. By focusing on getting a system up as fast as possible, an executive can implement a useful vision for a particular set of requirements.

Senior executives should also continue their support of the project with their time, ideas, and budget—at least through the pilot phase. They need to avoid the "intergalactic database" approach, which attempts to combine all conceivably relevant data in a single database. Rarely is such scope necessary. They should think of executive computing as high probability research and development, which, if successful, could make a difference in the firm's prosperity. It's too difficult to assign quantitative value to "better, faster information access" or "better management decisions."

Can a CEO succeed in developing an effective executive support system for his or her firm? Of course. It's no different from any of the myriad challenges that executives have overcome to attain success.

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SEAFIRST BANK

Pacific Northwest Executive is a publication of the University of Washington made possible by a grant from Seafirst Bank.

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Printing
Craftsman Press

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Pacific Northwest Executive is published four times a year in January, April, July, and October by the Graduate School of Business Administration, University of Washington. Permission is granted to quote, with credit.

Correspondence related to subscription or other business matters should be addressed to the Executive Editor, 336 Lewis Hall, DJ-10, University of Washington, Seattle, WA 98195, (206) 543-1819. We welcome requests for inclusion on our mailing list.

The purpose of *Pacific Northwest Executive* is to inform managers about economic, business, and public policy issues in the Pacific Northwest. The analyses, conclusions, and opinions expressed are those of the writers and not necessarily those of the University of Washington. Neither the University nor the financial sponsor of the magazine assumes responsibility for the views expressed, and publication does not necessarily imply endorsement.

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PACIFIC NORTHWEST Executive

A Regional Business Publication of the University of Washington Funded by Seafirst Bank

VOLUME 5, NUMBER 2 APRIL 1989

Computers in the Executive Suite: Are They Welcome? 2
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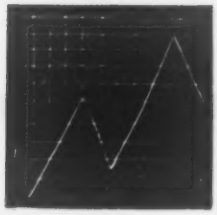
Computers in the Executive Suite: Are They Welcome?

by Richard Roth



As the computer revolution expands to include artificial intelligence and knowledge-based systems, we began to wonder how far up the corporate hierarchy the reformation has penetrated. Are there computers, for example, in the senior executive's corner suite? Or do executives see computers as too new, too time consuming, too hostile to users, or too representative of an unprestigious midlevel managerial role? Does corporate culture militate against executive computer use? Could it be that executives who use computers fear being seen as not doing their jobs of supervising, decision-making, and long-term planning? After all, if a technician is expected to depend on his or her computer to generate data and analyses, perhaps the executive who uses one is considered a mere number cruncher. Or can a computer play a role in an executive's management style?

We informally surveyed a handful of major area corporations (see table) and found that while the senior executives of tomorrow may plan on using computers, today's Pacific Northwest executives are emphatically *not* using them. Neither do they plan to use them, and in many cases, they don't even acknowledge computers as appropriate management tools. Instead, these executives depend on the computer analyses that midlevel managers generate to provide them with information. It may not be until after the midlevel managers move up that the full extent of the penetration of computers into corporate decision-making will become evident.

There are, of course, exceptions to the rule, and, in this case, we found that Boeing, Safeco, and Security Pacific Bank (formerly Rainier Bank) are moving quickly into so-called executive information systems (EIS). At Boeing, a company that is tight-lipped about its new EIS, the information system is apparently limited to senior executives. Other EIS programs are shared with midlevel analysts, as at Weyerhaeuser, or used throughout the company, as at Safeco. Some systems are based on the decision-making style of a particular manager; others generate scenarios by modeling current situations against company objectives, past decisions, and other variables. All executive information systems try to improve executive managing by linking analysis—the packaging and crunching of data—with decision-making—the delicate and dynamic art of synthesizing critical factors and applying them in a business world characterized by change and impermanence.

THE SKEPTICS

At least three major Pacific Northwest businesses—PACCAR, Weyerhaeuser, and Nordstrom—see executive computing as irrelevant at best and as a time-wasting device at worst. Their main objections to executive computer use are based on a vision of the senior executive as someone who interacts with people, who receives reports that include recommendations, and who makes decisions intuitively, using experience and judgment—the elements thought to be unprogrammable.

The vision of a computer-driven executive managing style, therefore, implies a degradation of judgment, which is universally acknowledged as the crucial dimension of executive power. Judgment, which is sometimes seen in a quasi mystical light, provides insight and intuition into people, plans, and the future. Somehow, the qualities that make a good executive are more intangible than those for a good manager, and what computer company can build intangibles into software?

Execution, Not Analysis

The practical, tangible argument against executive computer use is clearly expressed by Dean Watkins, the corporate data processing manager at PACCAR, who described his company's emphasis on uncluttered reports from staff. "I'm just not sold on the cost justification for personal computers," Watkins claims. "Senior executives have assistants, rather than personal computers. They're juggling projects and fighting a lot of fires at once, and computer time isn't adding value to the company—at least given our management style. No senior executive should become a glorified data entry clerk." Watkins adds, voicing a common concern, that "too often, the personal computer is a status symbol for executives. All they need to do is take a picture and paste it onto a cardboard box."

Watkins's arguments are typical of the skeptics, and they echo the perception that senior executives neither massage information nor shape it. Executives get reports; they don't make them. And they don't want their analyses on a screen or on loads of printouts. They are doers, not analysts. And, since the computer is primarily an analytical tool, it isn't an executive management tool.

Similar arguments are voiced by Terry Graff, the director of finance for Weyerhaeuser Information Systems. Graff acknowledges that while there is now a significant amount of midlevel managerial computer use at Weyerhaeuser, the executives don't participate, even though their questions "shape the data" that is supplied and considered. "Computing and analyzing aren't an executive's job," Graff argues. "True, they need better and more understandable data in the summaries they receive from midlevel managers, but I anticipate no work stations on their desks in the near term."

Graff adds that many midlevel managers, including himself, have recently stopped using computers. "It consumed too much time and made me less effective as a manager," he says. "My job is more to ask the right questions and direct the right people to answer them. I don't have time to figure out spread sheets or data bases or to sort through data. I was doing all that, but I felt it was causing me to be less effective. You can't ask the machine what the necessary data, analyses, and reports are. It's indiscriminate." Graff believes that some people want to be superior analysts instead of executive managers, so they like to use their computer tools, they like to bring data up and manipulate it. But, he argues, "executive managers look for someone else to do the tradeoffs, the analyses."

Robert Bender, one of Nordstrom's five senior executives, agrees with Graff that computer programs are often inflexible and too literal, and says that they don't suit corporate decision-making at the Seattle-based retailer. In fact, no senior executive at Nordstrom uses a computer. "We get the data we need every day from printouts," Bender reports. "Sales figures are the key to our business. All our buyers are on terminals, and we have the capability to ex-

amine their orders if we want to. But, the buyers' first priority is to be close to the floor and so they file few reports themselves." In Bender's opinion, since computer printouts are not "close to the floor," computer analysis is largely irrelevant to his role as an executive watchdog.

The Art of Executive Managing

Beneath the standard practical arguments against executives-as-number-crunchers is the more elusive contention that the work of an executive is more of an art form than an analytical skill, an ability developed over a lifetime of experience. Corporate culture strongly suggests that senior executives should only be seen doing communications work—meeting people face to face or talking on the phone—and that these men and women simply cannot be represented literally in any software, no matter how closely tailored it is to fit the individual executive. Decisions—each of which is unique—are based on intangibles and are solution-driven, not data-driven. Executives don't need computers to do what they do best: listen for the nuances in people's voices, watch their faces, look for the telltale details, and then make decisions.

No wonder they prefer face-to-face meetings, where personal judgment and friendly persuasion come into play, to cold data, no matter how artfully manipulated. "Data is presented to the executives, it's laid out in front of them," explains PACCAR's Watkins. "Midlevel people do the interpreting and translating, are given other reports, and consolidate them. When it's meeting time, the interpretation stage is over. Analysis is but the handmaiden to negotiation and compromise and persuasion."

To Graff, one major obstacle to executive computing is that each major executive decision is unique. As he explains it, each instance involves different bits of prior thinking and decisions, a different constellation of variables, and a special mix of personalities. Each of these considerations shapes the executive's decision and his or her plans for implementing that decision. "For example," Graff says, "a lot depends on your confidence in your people, and with different people you might use a different approach. That's the judgment element." Graff further argues that "most executives have an ego built into their experience. They trust their own judgment and they rely on the people they trust. That's why they're slow to accept analysis and judgment from an unknown entity, be it a person or a machine."

Bender says that Nordstrom's method for making a location decision, for example, is to "work with local developers who have demographic studies. We walk the land collectively and individually to get a feel. And getting a feel is crucial. The computer can perhaps tell us what's not selling, but it can't tell us what customers want. There's no substitute for shoe leather in this business, for staying close to the customer."

The human voice, the human face, confidence, and shoe leather: behind each of these unprogrammable dimensions is the deeply ingrained notion that human beings are far more complex than computer programs can ever be. Reading the grain of these complexities in a given context is an art form, a style, that can't be taught, packaged, or simulated.

THE BELIEVERS

While such strong and varied skepticism about executive computer use remains the norm among the regional giants we surveyed, we did find both major and tentative computing developments, commitments, and experiments in several executive offices. At Weyerhaeuser, for example, computer use still remains isolated; at Safeco, it's in the experimental stage; and at the executive summit of Boeing, the use of executive information systems is secretive.

Generally, those who champion executive computing offer a vision of increased collaboration between management levels, greater awareness of management and production processes, more timely decisions, better trouble-shooting, and enhanced strategic planning. In short, the believers argue that executives need to regard computers as a management tool, not just a word processor, spreadsheet generator, or report writer. Furthermore, these men and women claim that computers close the gap between analysis and management by providing valuable new information on existing

Senior Executive Computer Use: Informal Company Estimates

Company	Percent of Senior Executives Who Use Computers Daily	System
BOEING	33–50	Customized executive information system
BURLINGTON NORTHERN	none	none
PACCAR	less than 10	none
SECURITY PACIFIC BANK (formerly Rainier Bank)	less than 10	IBM PROFS plus tailored in-house system
NORDSTROM	none	none
WEYERHAEUSER	less than 10	PROFS system plus development of in-house system
SAFECO	15–33	Customized executive knowledge-based information system

situations and emerging trends and by redefining the process through which executives reason and make decisions.

New Analytical Slices

New kinds of information or new ways of aggregating existing information are often spoken of as the emerging competitive advantages for the computer-savvy executive. Safeco appears to be ahead of other Northwest firms in terms of fitting executive information systems to the company's need for the analysis of conditions, trends, causes, and the interplay of interdependent variables. Richard Anderson, the senior vice president for administration, explains that Safeco has been "quick to automate and has long had a communications network between regions for policy issue purposes. In fact, Safeco was the first in the region to use an information management system."

Such computerization is commonplace in the insurance industry, which is the most heavily automated sector of the economy. Insurance companies have a nearly one-to-one ratio of terminals or personal computers to employees. With its national network of regional managers and independent agents, Safeco uses its microcomputer as an interactive communications network to link company and agency offices, and Anderson estimates that the system processes 20,000 messages daily.

At the heart of Safeco's network is an information system that is used by everyone from the underwriter manager all the way up to the senior vice president in commercial lines underwriting. According to Anderson, this system extends and deepens agency analysis of volume, loss ratios, reserving conditions, summary reviews, bottom-line profits—all, as he puts it, "with various levels of screens," that can give the manager or senior vice president as much or as little information as needed.

The result, Anderson explains, is that "if an agent is talking to the senior vice president and he or she needs data, it's all there. The executive can go up or down to any level, including right to how many folks in which state slipped and broke their arms and were on worker's compensation. All of this can be generated instantly in reports, scenarios, and projections—if you just probe."

For the last five years, Safeco has also had a premium and loss system that tests scenarios, monitors performance against objectives, and forecasts product success and the effects of rate changes. Its main advantage, Anderson says, is that "it's interactive and can shorten the decision-making process when the local office and home office are involved. It also helps us avoid a lot of duplication and second-guessing in that changes get made at each level on the way up; these changes are agreed on, reviewed systematically, then summarized."

Jack Larson, the vice president for total quality management at Weyerhaeuser, is, along with several of his colleagues, starting to use an executive information system "in an applied way, but we're still a minority." Larson and other top managers are developing an analytical system that, he says, "can document internal work processes and get them all in a software package. We want the ability to do some flow charting and measure processes, rather than merely chart the results."

In essence, this system is reformulating and recharacterizing existing data to produce new kinds of information. "So," Larson explains, "we're using Pareto optimization charts, work flows, and histograms to build an expert system, one that is plugged into other systems at Weyerhaeuser and can aggregate old data in new ways."

Another strong advocate of managerial information systems is Richard Brandt, the executive vice president of Security Pacific Automation Company, which is an operating arm of Security Pacific Bank (formerly Rainier Bank). One of the two senior executives we interviewed with a personal computer on his desk, Brandt has an advanced IBM PROFS system that generates reports, transfers documents, builds agendas and calendars, and is tailored to funnel reports from subordinates to Brandt's office. He sees the system as a strategic necessity, and says, "I'm showing it to others on the executive floor and hope that it will gradually expand upward."

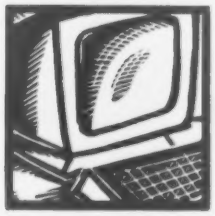
Brandt professes little interest in hardware or software per se. "I'm more interested in the kinds of information we put into the PROFS system, how that information is maintained and updated, and how it is used. Believe me, it's no small task to decide what information to put in at which level."

Brandt uses the information system, for example, for modeling, so that data from the general ledger can be verified against planning and projection figures. He also uses it for strategizing: "If we're planning, say, to increase processing by expansion, do we know that we can still be competitive in our market? We need to be able to get the pieces for that analysis and be confident that they're accurate and up to date. We also must be able to ask questions, come back a week later, and see how variables such as volume and cost trends have changed." Another function of PROFS is problem tracking. "The first thing I do every morning," Brandt says, "is turn on my machine and check on yesterday's problems and the overnight developments. If a problem hasn't been addressed, I want to know who's fixing it and when I can expect to hear from that person."

THE INNOVATIONS

The most exciting development at Safeco these days is a new custom executive information system called PROBE. Richard Anderson says that PROBE will be built on a knowledge base of if-then rules and can be used to evaluate situations and make decisions. "So far we've identified more than 500 such rules, and we're arranging them in layers so that a regional manager, given a certain question and a set of prescribed conditions, can have scenarios and decisions kicked out to him instantly."

Anderson explains that Safeco "looked for an outside knowledge-based system, but none fit our needs exactly," so the company has worked with knowledge engineers to customize a system. Even so, he says, "we find that we have to keep adding layers of information to it. The system's definitely a management tool, a way to probe into conditions, and analyze causes and effects to pinpoint what we need." About 80 to 100 executives across the country are using the PROBE prototype.



Such sophisticated attempts to provide more systematic overviews of the executive knowledge-building process strike at the heart of the executive function, and this procedure can be threatening or liberating. When you question what it is that executives should monitor and how they question and analyze, you begin to challenge their procedural reasoning patterns, their habits of inference, and their personal decision-making styles.

One ambitious effort to build an information system based on how decisions are made is taking place at Security Pacific. Richard Brandt has examined some of the thornier problems executive management-decision systems can run into and has, in the past five years, built his system from the bottom up. He argues that the only way to construct such a system is incrementally, by constantly evaluating and reevaluating, at the operational level, who needs to know what and who needs to generate that material. "What is appropriate for a particular level?" Brandt asks. "What can be done on the machine that used to be done in person or over the phone? What shouldn't be done on the machine?"

He cautions anyone contemplating an information management approach that "you have to learn how to manage all over again —the computer is no substitute for managing, believe me. It's just another tool." To help him in his position as a manager, Brandt receives "high-level performance reports, with the right amount of critical information" from his subordinates. The results so far have delighted him. "I've never before had information so complete, so timely, and of such high quality, and it's made decision-making much faster in some cases. Before, it took 10 people to gather and synthesize the same information I can now get at my terminal."

One difference that Brandt notes is his staff's ability to generate alternatives and supporting documentation. "I've had to learn to define the task carefully," he explains, "and then make it clear what I want. At first, I'd get 186-page printouts with little synthesis. Now they give me the two or three best alternatives and explain why they like them. But before they could learn to winnow it down, I had to learn to be more definite in my instructions."

In other words, careful executive management is needed, especially at first, when everyone is a little too credulous about how this wondrous system is going to change the way a company does business. It may mean that executives look less at existing patterns and more at the processes underlying those patterns. At the outset, however, both executives and midlevel managers have to learn how to define relevant processes and data patterns, so that, among other things, they don't tailor a system that provides answers to questions nobody asks or generates printouts nobody reads. Brandt may be able to delve through eight layers of aggregates to get to raw data, but someone still had to define those eight layers. There aren't any analytical shortcuts, but there can be hidden problems, such as the need for simple status updates for major projects, and a few surprises.

Computerization, Brandt admits, didn't reduce his staff, contrary to the widely held belief. "The reality is that the people don't go away. As the computer system gets more complex—accommodates more growth, takes on actuality—you have more capability, and you tend to do and try more things. You burn up that productivity gain, and staffing becomes more of a management challenge than a productivity calculation."

Because of this spiraling increase of complexity and sophistication of analysis, Brandt concludes that computer-aided management is "more evolutionary than revolutionary. When you use a computer program and it solves a problem, you begin to think of other ways to use it or modify it. You think, 'Aha! If we could put in this change and that change, and this and this and this. . . .' As you become more adept at that form of management, you move from capability to opportunity to capability, always bringing more people into the process. The key factors for executives are communication, planning and, above all, managing."

For all his enthusiasm, however, Richard Brandt advises managers not to see computer-driven management decision systems as panaceas: "We don't depend on the system to manage our business. It's just a tool, and if we were to become dependent on it, that would be dangerous." Brandt, like his skeptical counterparts at PACCAR, Weyerhaeuser, and Nordstrom, still relies as much on his stomach as his head and believes that executive managing has an intuitive dimension. "As a manager," he says, "I know where we are on various projects, and if I start to sense that we're getting off track somewhere I still have to use my intuition to anticipate or red-flag the numbers. Then I'd better start digging. This system, thank goodness, makes sure I don't have to dig through all the data on the history of the world to see where the problem is." The combination of manager and computer, Brandt thinks, simply calls attention to trouble spots sooner.

MORE THAN WHIZZ-BANG

Executive information management, even using the most complex systems, still focuses on basic management imperatives: know the data and how to define it; keep it simple, even in aggregate form; separate the decision-crucial wheat from the random-data chaff when sifting and preparing the data; and monitor the process vigilantly. The difference is that executive information systems can assist executives in clarifying the answers they're looking for, turning data into information, and making decision-making less intuitive—or at least make the implicit rules-of-thumb that guide intuition more explicit.

One thing is certain: when the talk turns from the quantity of information to the quality of information, then to how knowledge systems can provide a competitive advantage for executives, you can be sure that you're in the company of a believer. These men and women—even though they may represent only 10 percent of the senior executive community in the Pacific Northwest—have challenged the infrastructure of their decision-making process, the method behind their much-prized "judgment." The believers can be characterized by their ability to see beyond spreadsheets, report writing, and whizz-bang presentation graphics to the use of computers as management tools.

Richard Roth is a Seattle-based writer.

REGION WATCH

Economic Developments in the Pacific Northwest

As we enter the second quarter of 1989, the national economic expansion continues into its seventh year. The preliminary gross national product report for the fourth quarter of 1988 estimates the real GNP growth rate at 2.0 percent. This results in a 3.8 percent estimated real rate of increase for the entire year, a figure that falls near the long-term trend rate for the U.S. economy. The measured growth rate would have been considerably stronger in the absence of last summer's severe drought in the Midwest. The U.S. Bureau of Economic Analysis has determined that the fourth quarter would have come in at 3.1 percent if 1988 had been a normal crop year.

Such performance in the sixth year of an expansion is quite remarkable. The rate of growth is so strong, in fact, that there has been widespread speculation that the Federal Reserve Board may take further tightening measures to slow the expansion and dampen any incipient inflation pressures. Real growth is continuing, however, and we can expect it to do so throughout 1989, but at a modest pace that does not set off a new round of uncontrollable inflation.

The regional economy is also performing well. The previous year ended on an upbeat note, with the region's employment analysts announcing broadly based employment increases in each of the three states. As of November 1988, total nonagricultural employment in Washington was up 4.8 percent, compared with the same month in 1987; the comparable increases in Idaho and Oregon were 3.9 and 0.1 percent, respectively. Washington's unemployment rate in October 1988 fell to 5.5 percent, its lowest level since 1969, and Oregon analysts took comfort in a 19 percent employment gain since the end of the last recession in 1982. These numbers are impressive; our recovery has been strong, particularly in the last two years, as the result of an export boom that has pulled the Northwest out of a period of relatively sluggish growth.

The inevitable question raised by these employment trends is how long the expansion can continue. Employment growth tends to be strong and unemployment rates typically reach cyclical lows just before a recession. Do the good reports we're now receiving portend harder times to come? As University of Oregon economist Ed Whitelaw explains, policy-makers and business executives have a tendency to focus on recent trends, be they good or bad, and to ignore economic realities, such as long-run growth trends and short-run business cycles.

The contradictions in the economic data make it hard to pin down the likely arrival of the next recession. While many of the nation's business economists (polled by the National Association of Business Economists late in 1988) are predicting a late 1989 or 1990 recession, no consensus exists on the precise conditions that would generate a recession. Only a few of the nation's commodity markets are producing at the limits of their capacity, which suggests that there is room for the economy to grow. Export markets, responding to the lower value of the dollar, are providing new sources of demand for expanding businesses. The wage and hour trends in labor markets indicate a continued ability to extend the labor force in some parts of the country without engendering a new episode of wage-push inflation.

These national contradictions are present in the Pacific Northwest as well. Our solid wood products industry is, at this point, concerned about a decreasing number of new housing starts. The strong demand for export logs and the anticipated cutbacks in harvest rates on public land, however, are presenting supply problems for a number of mills, particularly the smaller independent ones and those designed to process large, old growth timber. The pulp and paper industry has been running at capacity for some time and has little ability to increase production. Boeing is manufacturing aircraft as fast as it can—perhaps too fast, given the recent media attention to quality control and labor force issues.

While these important regional sectors have limited short-run growth potential, the rest of the region's economy has considerable capacity for expansion. Many high-tech and traditional manufacturing industries have the leeway to grow. The steel industry is selling all it can produce and is investing to expand capacity in the Seattle area; this is a complete turnaround from the situation several years back, when plants were being shut down and scrapped.

Many of the region's producer service industries continue to expand, reshaping the skylines of downtown Portland and Seattle as they grow. In the major urban areas, increased congestion and quality of life issues are compelling manufacturing and service firms to look outside the cities for their expansion sites. Boeing and Seafirst Bank are establishing operations in Spokane, Lamb Weston is moving from Portland to the Tri-Cities, and smaller cities such as Yakima and Ellensburg along I-82 in Eastern Washington are marketing themselves as an alternative to the crowded I-5 corridor. Agriculture in the Pacific Northwest has limited opportunities, created by last year's drought in the Midwest, as well as a lower dollar, which makes our commodities more competitive in many parts of the world. The spread of population and economic growth from the major urban areas into the smaller communities and rural regions is especially encouraging.

Urban congestion also seems to be making smaller cities more attractive from a labor supply standpoint. And earnings in manufacturing industries continue to decline due to a combination of fairly stable wages and declining hours. These changes suggest that the region's labor force can be further expanded in this business cycle—without

Editor's note: "Economic Developments" was written by Paul Sommers.

the emergence of severe cost pressures—by increasing the number of hours worked or by new hiring, especially in smaller communities. As long as overseas or domestic market opportunities are found, the Pacific Northwest economy is well positioned to participate in the continuing growth of the national economy.

When will the expansion end? We may continue to be surprised by the longevity of this business cycle. Absent some major international crisis and worldwide recession, the most likely scenario for the next recession involves a combination of strong imbalances in the economy (industries that reach capacity limits, a labor force scarcity, increased backlogs, higher inflation rates) and a Bush-led reduction in the federal deficit, which would take some of the fiscal steam out of the economy. Those factors would take time to develop: the current economic imbalances are not severe, and new federal fiscal actions wouldn't be felt until after this coming October. It's likely to be well into 1990 or beyond before this expansion ends.

Forecast panel

The forecast panel's outlook for GNP is broadly consistent with this scenario (Table 1). Our 17 distinguished economists anticipate a gradual slowing of real GNP growth from the preliminary estimate of 3.8 percent in 1988 to a forecasted rate of 2.5 percent in 1989 and 2.0 percent in 1990. Their outlook for the Pacific Northwest is very positive; they forecast nominal personal income growth rates exceeding the rate of inflation by 1.6 to 3.0 percent, which would result in substantial real income growth throughout the region. That forecasted income growth is accompanied by their predictions of modest employment growth in the next two years. In combination, the forecasts suggest a continuing pattern of wage growth or increased nonwage income for residents of the region.

Table 1: Panel Forecasts
median annual percent changes

	REAL GROSS NATIONAL PRODUCT	IMPLICIT PRICE DEFLATOR
1987 actual	3.3	3.3
1988 prelim.	3.8	4.7
1989	2.5	4.5
1990	2.0	4.5

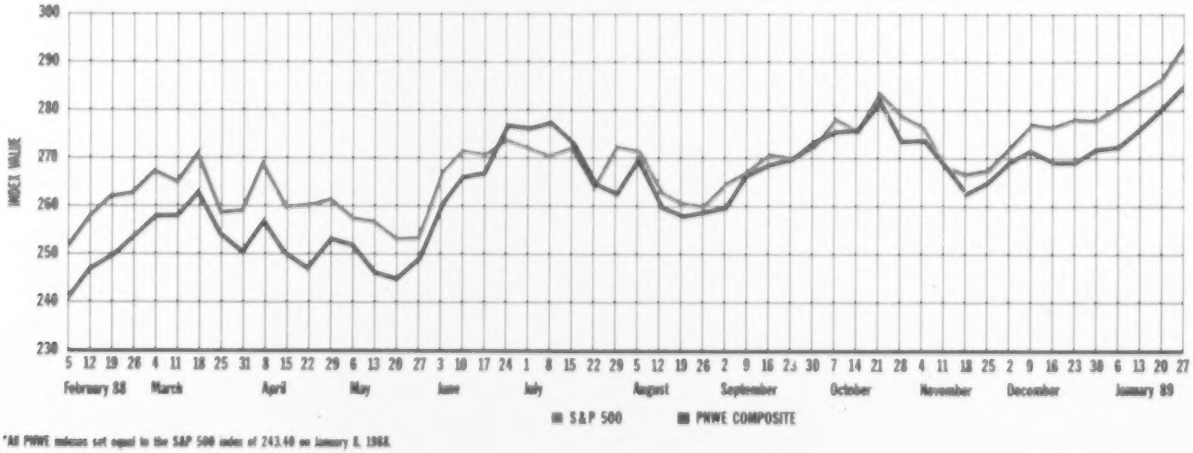
	NOMINAL PERSONAL INCOME	NON-AGRICULTURAL EMPLOYMENT	MANUFACTURING EMPLOYMENT
[redacted]			
1987 actual	6.7	4.6	4.4
1988 est.	7.9	4.6	6.3
1989	7.5	2.9	2.3
1990	6.5	2.4	2.0
[redacted]			
1987 actual	6.9	3.9	4.0
1988 est.	8.8	4.7	4.0
1989	7.5	2.7	1.5
1990	6.5	2.0	1.0
[redacted]			
1987 actual	5.9	−0.3	6.6
1988 est.	6.5*	4.1	3.8
1989	6.4	1.5	4.5
1990	6.1	1.2	2.7

*This figure is for the period from 1987:II to 1988:II.

Correction

In the last issue of *Pacific Northwest Executive* (January 1989), we failed to catch an error of our own creation in one of the figures in "Forecasting the Effects of Alternative Tax Reform Measures on Washington." Readers should note that the brown line in Figure 4 on page 17 corresponds to the midrange alternative and the gray line represents the business-tax alternative. In addition, real per capita disposable income under the household-tax alternative will increase by a maximum of 1.4 percent—not 1.6 percent. We apologize to the authors and to readers for any inconvenience these errors may have caused.

S&P 500 and the PNWE Index, February 5, 1988—January 27, 1989*



*All PNWE indexes set equal to the S&P 500 index of 243.40 on January 8, 1988.

Puget Sound Business Conditions Survey

by Paul Sommers

The *Pacific Northwest Executive*, in collaboration with the Greater Seattle Chamber of Commerce, the Seattle Economists Club, and the *Seattle Times*, has launched a Puget Sound Business Conditions Survey. The goal of this biannual study is to provide new indicators of business conditions in the metropolitan area, as well as business leaders' expectations for the future of the local economy.

The idea for the survey came from a Seattle Economists Club task force, headed by co-chairs Paul Ahern (an independent consultant) and Paul Sommers (Northwest Policy Center). The task force included economists from *Pacific Northwest Executive* (Michael Rahm), Seattle University (Mary Rivers and Barbara Yates), the Port of Seattle (Susan Doolittle), the *Seattle Times* (Suzanne Shwetz), the Chamber (Jim Mayfield), and King County (Michael Alvine). This group designed the questionnaire and, with the assistance of the sponsoring organizations, the first survey has been taken.

The questions were based on those of a business conditions survey carried out for many years by the National Association of Business Economists (NABE). While NABE surveys its own members, who represent leading industrial companies across the nation, the Puget Sound survey relies on the responses from senior executives, who are generally chief executive officers or chief financial officers of area businesses.

The sample frame that we chose to use consists of all private sector establishments that employ 250 or more workers in King, Pierce, and Snohomish counties, plus a random selection of smaller firms. In addition, the sample includes selected publicly owned organizations that engage in economic production; most of these are electric utilities. By including all large firms as well as representative smaller firms, the survey can gather information that demonstrates the breadth of the metropolitan area economy. The survey questionnaire asks for each respondent's evaluation, in terms of eight specific variables, of his or her company's performance in the last 12 months and his or her expectations for the company's performance in the next 12 months.

The survey was mailed out to 412 businesses in early January 1989. We received useable responses from 163 (91 large firms and 72 smaller businesses), for an overall response rate of 40 percent (Table 1). Collectively, these firms employ 96,105 workers —about 7 percent of the work force in the three-county area. The response rate for large firms was somewhat larger than that for smaller firms, and we found that the distribution of the respondents by county and industry is fairly close to that of the

Table 1: Sample Characteristics of the Puget Sound Business Conditions Survey

	PERCENT OF SAMPLE FRAME	PERCENT OF RESPONDENTS
Large firms	46	56
Small firms	54	44
King County	73	80
Pierce County	17	11
Snohomish County	11	9
Services	77	72
Goods	23	28
TOTAL	412	163
Response rate equals 40%		

Table 2: Overall Survey Results
weighted percent of 163 respondents

	MUCH LOWER < −10%	LOWER −10% TO −2.5%	NO CHANGE −2.5% TO 2.5%	HIGHER 2.5% TO 10%	MUCH HIGHER > 10%
SALES					
Last 12 months	1	4	13	44	38
Next 12 months	0	2	21	46	30
PRICES					
Last 12 months	0	4	50	43	3
Next 12 months	0	3	40	55	3
COSTS					
Last 12 months	0	1	36	57	7
Next 12 months	0	0	34	58	8
NET AFTER TAX PROFIT					
Last 12 months	2	11	42	20	24
Next 12 months	2	3	41	31	24
WAGES					
Last 12 months	0	1	24	74	0
Next 12 months	0	0	23	75	2
INVENTORIES					
Last 12 months	6	20	45	13	16
Next 12 months	0	5	67	15	13
CAPITAL EXPENDITURES					
Last 12 months	3	4	50	22	22
Next 12 months	2	3	50	25	20
EMPLOYMENT					
Last 12 months	0	10	58	16	16
Next 12 months	3	10	57	26	5

sample frame. The returns, then, are quite representative of the urban area economy.

Readers should note that all of the following responses and the information in Tables 2 and 3 are weighted by employment. Boeing is not included in the sample; if the company had participated, its response would outweigh that of all other participants combined. While Boeing does have a predominate influence on the local economy, the survey was designed to reflect the business prospects of the rest of the region's firms—even though some of them are directly affected by Boeing as subcontractors or as providers of goods and services to Boeing employees. In addition, the Boeing Company is understandably reluctant to participate in survey studies precisely because of the signals that its responses would send to the community. Instead, we provide a summary of Boeing's public statements regarding its performance in the past year and its expectations for the next year. Readers will then have a context for the discussion of the performance and prospects of the region's many other firms.

Boeing turned in an excellent performance in 1988. Its sales of $16.96 billion represented an increase of 9 percent in comparison with 1987, and the 1987 total was itself a historical record. Earnings per share of $4.02 were up 28 percent over 1987. Employment at Boeing facilities in Washington stood at 97,000, a 9 percent increase, at the year's end. The only information available concerning Boeing's expectations for 1989 is a projection of $22 billion in total yearly sales, which represents a 30 percent increase in comparison with the 1988 total.

According to our business conditions survey, the Puget Sound's firms had a good year in terms of sales (Table 2). The median response was a 2.5 percent to 10 percent sales increase. Wages, other costs, and the prices charged by these firms for their products also went up, which resulted in modest profits after taxes (the median response was in the "no change" category). About half of the business community had no major capital expenditures in 1988, and more than half said that their companies had made no substantial employment changes.

Smaller businesses, according to a variety of studies, have been the source of much of this decade's employment growth in the Puget Sound. Our survey sample of small businesses shows that they experienced greater employment growth in 1988 than did the large firms. An average of 42 percent of the smaller firms expanded their employment by between 2.5 and 10 percent, and an additional 11 percent grew at more than 10 percent. The smaller firms had lower wage increases than did the large firms. Fifty-nine percent of the smaller firms reported no substantial wage changes, compared with only 24 percent of the total sample, which is dominated by responses from large firms.

The area's service sector firms experienced a distinctly higher rate of change, in terms of wages, nonwage costs, and the prices charged by those companies, in 1988 than did the goods producing firms. Service firm capital expenditures also increased more rapidly than those of goods producing firms. The employment figures for both types of firms are fairly close.

The total survey sample's outlook for the rest of 1989 (Table 2) indicates projected sales increases similar to 1988 (a median increase of 2.5 to 10 percent), but the businesses anticipate that prices will rise sharply. The sample firms expect that employment and capital expenditure patterns will resemble those of 1988. Three-quarters of the businesses in the sample believe that there will be a 2.5 to 10 percent wage increase in 1989, an expectation that indicates a tightening labor market in the Puget Sound. The service sector firms also anticipate continued higher rates of increases in wages and costs (Table 3). The goods producing firms also expect high rates of increase in 1989, but not to the same extent.

Of the 163 respondents, 62 firms, or 38 percent, indicated that they plan to expand their physical facilities during 1989. Of these 62 expanding businesses, 57 noted that the expansion would take place within the King, Pierce, and Snohomish urban area. While Boeing and Seafirst Bank may be looking at expansion sites outside the region, the survey results indicate that virtually all the expansion of the Puget Sound's businesses during 1989 will take place within the metropolitan area.

Table 3: Services and Goods Sector Expectations for 1989
weighted percent of 163 respondents

	MUCH LOWER < −10%	LOWER −10% TO −2.5%	NO CHANGE −2.5% TO 2.5%	HIGHER 2.5% TO 10%	MUCH HIGHER > 10%
SALES					
Services	0	0	13	49	38
Goods	1	2	36	42	15
PRICES					
Services	0	3	42	52	3
Goods	0	2	34	62	2
COSTS					
Services	1	1	30	61	8
Goods	0	0	41	51	8
NET AFTER TAX PROFIT					
Services	5	6	50	28	12
Goods	0	1	36	33	30
WAGES					
Services	0	0	8	91	1
Goods	0	0	50	45	5
INVENTORIES					
Services	0	8	64	8	21
Goods	0	1	73	26	0
CAPITAL EXPENDITURES					
Services	2	3	47	23	24
Goods	0	5	53	30	12
EMPLOYMENT					
Services	0	13	56	26	5
Goods	8	4	57	26	5

The Primary Aluminum Industry and Electric Power in the Pacific Northwest

The Pacific Northwest's primary aluminum industry has been in a state of crisis or near crisis for much of the 1980s. To produce a pound of raw aluminum, it takes 6 to 8 kilowatt-hours of electricity, so large amounts of reliable, low-cost power are essential to the industry. The Pacific Northwest had just such power until 10 years ago, but with the enormous run-up of electric rates since 1979, the industry's future has become clouded—even though aluminum prices are now near all-time highs, and smelters are running at full capacity.

Early History of the Industry

Although aluminum is the third most common element in the earth's crust, its metallic form was so expensive one hundred years ago that it was used almost exclusively in jewelry. Not until a practical electrolytic reduction process was developed simultaneously by Charles Martin Hall in the United States and by Paul L. T. Heroult in France in the late 1880s could the abundant supply of aluminum ores—particularly bauxite—be converted to metal at a reasonable cost.

The early days of the aluminum industry were characterized by the product's rapid penetration of new markets and by the virtual monopoly of Alcoa (Aluminum Company of America), which owned the patents on the Hall electrolytic process. It also quickly became evident that the critical cost variable for the fledgling industry was electric power. In 1895 Alcoa became the first and largest customer of the newly formed Niagara Falls Power Company in upstate New York. This pattern of locating reduction facilities near cheap and abundant sources of electricity was to be repeated along the St. Lawrence, in the Ohio and Tennessee valleys, and later in the Pacific Northwest and along the Gulf Coast.

Prior to World War I, aluminum was used principally for cooking utensils and a variety of household items, such as washboards, eggbeaters, and canning jar lids. It also found ready acceptance in the growing electric utility industry, since its unique combination of light weight and conductivity made it ideal for transmission lines. In fact, one of the first such applications was in 1900, when the new power plant at Snoqualmie Falls began transmitting to Seattle.

The major potential market for aluminum, however, was clearly understood to be war materiel, and the metal's potential was soon realized. In 1915 Alcoa, which was still the only U.S. manufacturer, produced 55,000 tons of aluminum; by 1917 the company was generating 100,000 tons. More than 90 percent of total production, both in North America and in Europe, was going into war equipment and supplies, with the Allies using 90,000 tons in the manufacture of aircraft alone. Aluminum emerged from World War I both as a major industry and as a strategic substance.

In the interwar period, the markets for aluminum continued to expand. The material's weight and ability to dissipate heat made it ideal for automobile pistons, radiators, and other automotive components. And aluminum was absolutely essential to the development of larger and more efficient aircraft. By the late 1930s, U.S. consumption was double the peak production levels of World War I.

With the onset of World War II, aluminum output skyrocketed. Between 1939 and 1942, U.S. and Canadian production jumped from 220,000 tons per year to 770,000 tons and reached 1.1 million tons by 1944. It was during this period of explosive growth that the Columbia River's new hydroelectric capacity came on line. With the completion of the Bonneville Dam in 1938 and Grand Coulee Dam shortly thereafter, the Northwest had generating capacity far in excess of existing demand. In late 1939, Alcoa signed a 20-year contract with Bonneville for 32.5 megawatts of power to supply a Vancouver, Washington, aluminum reduction plant. This contract was soon doubled and redoubled, and by 1942 Alcoa had a commitment for 182.5 megawatts—about one-third of the Bonneville Dam's generating capacity.

The Reynolds Company, which had been manufacturing foil for cigarette packaging from Alcoa ingot, secured a loan from the Reconstruction Finance Corporation in 1940 to build an aluminum reduction plant in Longview. And, as part of the build-up in aluminum capacity required for the war effort, the federally funded Defense Plant Corporation built smelters in Spokane, Tacoma, and Troutdale, Oregon. During the war, all three defense plants were managed by Alcoa.

By the end of World War II, the federal government owned almost one-half of the aluminum smelting capacity in the United States. Much of this wartime capacity was unnecessary in peacetime, and many smelters had been poorly located. But several of the plants, including the three in the Pacific Northwest, were economically viable. Alcoa quickly bid to obtain this capacity in 1945, but was rebuffed by the federal government, which was in favor of establishing two new competitors, Reynolds Metals and Kaiser Aluminum and Chemical. Reynolds purchased Troutdale and a plant in Arkansas, and Kaiser bought the Spokane and Tacoma smelters—all at discounts of 40 to 70 percent of their original wartime construction cost. In a few short years, the aluminum industry was a major component in the Pacific Northwest's economy, and Alcoa's share of primary aluminum production in the United States had been halved.

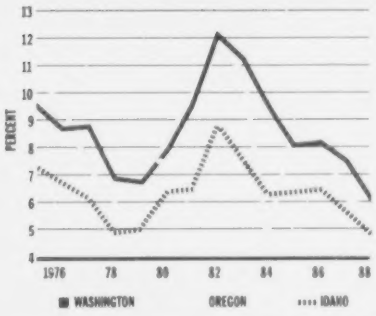
After the war, the range of uses for aluminum expanded rapidly. Construction, particularly of homes, was booming, and a variety of construction products, including aluminum siding, were now on the market. Reynolds, combining its experience in foil manufacture and consumer marketing, introduced household foil. And aluminum began its entry into food and beverage packaging, receiving a strong boost from the newly popular TV dinner.

The industry's cycle of rapid wartime build-up was repeated during the Korean conflict in the early 1950s. And the Pacific

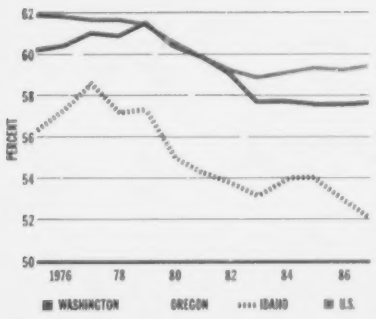
(continued on page 14)

REGION WATCH

UNEMPLOYMENT RATES[2,3,4]

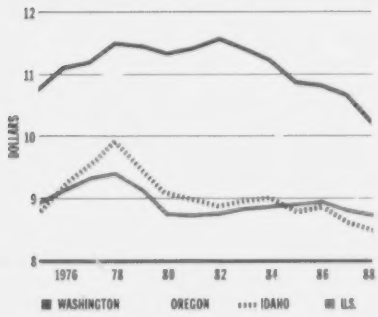


WAGES & SALARIES AS PERCENT OF PERSONAL INCOME[3]

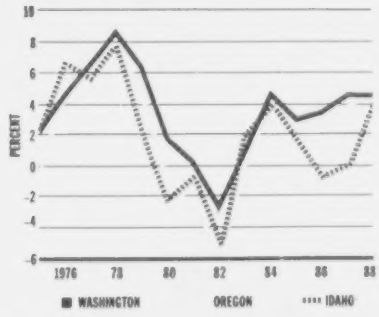


REAL HOURLY EARNINGS[4,7]

of manufacturing production workers, in 1984 $



CHANGE IN PAYROLL EMPLOYMENT[2]



LABOR FORCE[2,3,4]

In thousands

YEAR	WA	OR	ID
1975	1,561	1,030	369
1976	1,621	1,068	392
1977	1,691	1,130	410
1978	1,808	1,224	428
1979	1,937	1,243	436
1980	1,985	1,297	424
1981	1,996	1,339	422
1982	2,024	1,323	419
1983	2,068	1,341	421
1984	2,051	1,334	427
1985	2,091	1,317	433
1986	2,199	1,360	431
1987	2,255	1,388	425
1988	2,295	1,408	437

EMPLOYMENT[2,3,4]

In thousands

WA	OR	ID
1,412	929	342
1,481	966	367
1,544	1,047	384
1,634	1,149	407
1,806	1,158	414
1,823	1,189	397
1,806	1,207	395
1,779	1,171	382
1,833	1,196	390
1,857	1,209	400
1,921	1,202	405
2,018	1,245	403
2,085	1,301	401
2,153	1,226	415

UNEMPLOYMENT[2,3,4]

In thousands

WA	OR	ID
149	139	27
140	102	26
148	83	26
124	74	21
131	85	22
156	107	27
190	132	27
245	153	37
231	145	32
194	125	27
170	116	28
180	115	28
171	86	24
141	82	21

AVERAGE WEEKLY EARNINGS[6]

manufacturing production workers
In dollars

YEAR	WA	OR	ID
1975	225.23	212.35	185.08
1976	248.68	236.12	204.72
1977	267.74	257.46	228.73
1978	297.11	281.97	253.36
1979	323.85	304.92	265.04
1980	361.34	329.57	280.11
1981	405.07	355.13	311.09
1982	432.36	379.76	316.35
1983	444.24	397.17	335.85
1984	450.47	409.25	351.18
1985	453.57	406.35	355.70
1986	463.74	412.23	369.01
1987	479.28	413.95	370.54
1988	479.20	419.22	376.35

AVERAGE WEEKLY HOURS WORKED[6]

manufacturing production workers
In hours

WA	OR	ID
38.7	38.4	38.8
39.1	38.9	38.7
39.2	38.6	39.3
39.3	39.0	38.8
38.6	38.5	38.3
38.4	38.1	37.1
38.8	37.5	37.8
38.5	37.9	36.7
38.9	38.9	37.4
38.8	39.2	37.6
39.0	38.7	37.8
39.4	39.0	38.2
39.9	39.2	38.2
40.1	39.4	37.9

NOMINAL EARNINGS PER HOUR[6]

manufacturing production workers
In dollars

YEAR	WA	OR	ID
1975	5.82	5.53	4.77
1976	6.36	6.07	5.29
1977	6.83	6.67	5.82
1978	7.56	7.23	6.53
1979	8.39	7.92	6.92
1980	9.41	8.65	7.55
1981	10.44	9.47	8.23
1982	11.23	10.02	8.62
1983	11.42	10.21	8.98
1984	11.61	10.44	9.34
1985	11.63	10.50	9.41
1986	11.77	10.57	9.66
1987	12.01	10.56	9.70
1988	11.95	10.64	9.93

REAL EARNINGS PER HOUR[6,7]

manufacturing production workers
In 1984 dollars

WA	OR	ID
10.76	10.22	8.82
11.12	10.61	9.25
11.22	10.95	9.56
11.52	11.02	9.95
11.48	10.83	9.47
11.35	10.43	9.11
11.42	10.38	9.00
11.59	10.34	8.90
11.44	10.23	9.00
11.24	10.11	9.04
10.88	9.82	8.80
10.84	9.73	8.89
10.63	9.39	8.62
10.21	9.09	8.49

NONAGRICULTURAL WAGE AND SALARY EMPLOYMENT, 1988[1,8]

by Industry
In thousands

	WA	OR	ID
TOTAL NONAGRICULTURAL EMPLOYMENT	1,937.0	1,152.3	346.8
MANUFACTURING	338.6	214.3	57.7
DURABLE GOODS	241.0	155.9	29.2
Lumber and Wood Products	41.0	68.7	13.8
Furniture and Fixtures	4.2	2.7	NA
Stone, Clay, and Glass Products	7.5	4.1	0.9
Primary Metals	12.8	10.2	NA
Aluminum	8.7	NA	NA
Fabricated Metals	10.9	11.0	2.0
Machinery, Excluding Electrical	31.5	17.1	5.4
Electrical Equipment	13.5	15.3	4.1
Transportation Equipment	116.0	11.2	NA
Aerospace	101.0	NA	NA
Other Transportation Equipment	15.0	NA	NA
Instruments and Related Products	11.5	11.9	NA
Other Durable Goods	5.3	3.7	2.8
NONDURABLE GOODS	97.6	58.4	28.5
Food and Kindred Products	33.1	24.1	17.2
Textiles, Apparel, and Allied Products	6.1	4.5	NA
Paper and Allied Products	17.0	8.7	1.8
Printing and Publishing	21.4	13.5	4.4
Chemicals and Allied Products	10.6	2.2	3.5
Other Nondurable Goods	9.5	5.4	1.3
NONMANUFACTURING	1,598.4	938.0	289.0
MINING AND QUARRYING	3.3	1.4	3.2
CONSTRUCTION	96.0	39.0	14.3
TRANSPORTATION, COMMUNICATION, AND UTILITIES	101.5	60.5	18.4
TRADE	475.2	291.3	86.3
Wholesale Trade	115.5	72.0	20.5
Retail Trade	359.7	219.3	65.8
FINANCE, INSURANCE, AND REALTY	109.8	73.6	19.3
SERVICE AND MISCELLANEOUS	444.3	260.6	71.9
GOVERNMENT	368.4	211.5	75.2
Federal	71.6	31.7	12.7
State and Local	296.8	179.8	62.2
Education	155.0	99.3	33.9
Other	141.8	80.6	28.5

AVERAGE HOURLY EARNINGS, 1988[2,9]

by Industry
In dollars

	WA	OR	ID
MANUFACTURING	11.95	10.64	9.93
DURABLE GOODS	NA	10.75	NA
Lumber and Wood Products	10.96	10.90	10.51
Furniture and Fixtures	NA	8.63	NA
Primary Metals	12.70	11.98	NA
Fabricated Metals	11.33	9.70	NA
Machinery	9.41	10.96	NA
NONDURABLE GOODS	NA	10.31	NA
Food and Kindred Products	9.31	8.51	8.17
Textiles, Apparel, and Allied Products	NA	13.13	NA
Paper and Allied Products	NA	15.01	NA
Printing and Publishing	NA	11.94	NA
Chemicals and Allied Products	15.94	NA	NA
NONMANUFACTURING	NA	NA	NA
MINING AND QUARRYING	NA	NA	13.55
CONSTRUCTION	16.14	14.10	13.43
TRANSPORTATION, COMMUNICATION, AND UTILITIES	NA	13.06	NA
TRADE	9.46	8.86	7.62
Wholesale Trade	NA	10.70	8.62
Retail Trade	NA	7.81	7.09

NOTES:
1. All 1988 figures are preliminary estimates.
2. Washington State Employment Security Department, State of Oregon Employment Division, and State of Idaho Department of Employment.
3. Unemployment rates cannot be calculated directly from the tables due to rounding.
4. Washington and Oregon data from 1978 to the present has been revised to incorporate a methodology change. See the July 1988 *Monthly Labor Review* for details.
5. Bureau of Economic Analysis, U.S. Department of Commerce.
6. Washington State Employment Security Department, State of Oregon Employment Division, State of Idaho Department of Employment, and U.S. Bureau of Labor Statistics, Employment, Hours, and Earnings.
7. Computed using the U.S. Consumer Price Index for urban wage earners and clerical workers (CPI-W) from the U.S. Bureau of Labor Statistics.
8. Excludes workers in labor disputes.
9. Washington data on fabricated metals, machinery, chemicals, and trade industries deviate slightly from BLS definitions and are not strictly comparable to data from other states.

Sources of Information on Employment and Earnings

There are several alternative employment and payroll data series available to people interested in labor force statistics. Due to methodological differences, care must be taken to use the data appropriately. Monthly data reflect pronouced seasonal changes and should be seasonally adjusted where interest centers on cyclical changes. The following summary outlines the distinctive characteristics of the major series and provides a guide to sources of more detailed information.

LABOR FORCE STATISTICS. Resident civilian labor force and employment statistics provide information about the size of the labor force, the number of persons employed, and the number of persons unemployed. By definition, the labor force is the sum of the employed and unemployed. The employed portion of the labor force, which includes the self-employed as well as part- or full-time employees, is estimated on a place of work basis using surveys and adjusted to a place of residence basis using Current Population Survey data. State estimates of unemployment are based on state unemployment insurance (UI) records with adjustments to include data from the Current Population Survey. These data do not provide industry detail, but are available for states, counties, and selected SMSAs on a monthly basis.

PAYROLL STATISTICS. Nonagricultural wage and salary employment, also called payroll employment, is estimated each month on the basis of information provided by a sample of cooperating establishments on data collection forms called "shuttle schedules." The data are collected each month by state employment agencies. These data are available for states, counties, and selected SMSAs on a monthly basis. The shuttle schedules also provide monthly data on average hours and earnings for production and related workers in selected industries. Although providing considerable detail by industry, this series does not cover farm workers, the self-employed, unpaid family workers, or military personnel.

UNEMPLOYMENT INSURANCE STATISTICS. The quarterly "covered employment" statistics include employment and payroll data by industry for employees who are covered by state UI programs. Although providing more extensive industry detail than the monthly payroll statistics, the data do not include all workers covered by state insurance programs. Comparability over time and among states is not assured because of eligibility differences.

OTHER EMPLOYMENT RELATED DATA SERIES. In addition to the different measures of employment described above, other data series are available to describe the demographic features of workers, wage rates, occupational distributions, and other characteristics of the working and unemployed population in each state. Further information may be obtained by contacting the statistical division of the state employment agencies: the Employment Security Department, Labor Market and Economic Analysis Board in Olympia, Washington; the Department of Human Resources Employment Division, Research Statistics Section in Salem, Oregon; and the Department of Employment, Bureau of Research Analysis in Boise, Idaho.

Northwest participated with the addition of the Anaconda smelter at Columbia Falls, Montana, a new Alcoa facility in Wenatchee, and the Harvey aluminum plant at The Dalles.

Because the Korean War had prompted a 70-percent increase in U.S. aluminum capacity, there was little demand for new smelters in the latter half of the 1950s. The penetration of aluminum into new markets persisted, however, and U.S. consumption of aluminum continued to grow at 10 percent per year. The systematic damming of the Columbia River system opened opportunities for still more aluminum capacity in the Pacific Northwest, and new smelters at Ferndale and Goldendale, Washington, were constructed in the mid-1960s. By this time, the region accounted for 40 percent of U.S. aluminum reduction capacity, even though it was far removed from most of the industry's markets.

The Aluminum Industry and BPA

During the first two decades after World War II, the aluminum producers and the Bonneville Power Administration (BPA) maintained a mutually beneficial relationship. The Northwest's hydroelectric generating capacity was growing faster than the economy could absorb, and power sales to the aluminum industry, which consumes 90 percent of the electricity that BPA sells to "direct service industries," were a major source of revenue. The aluminum industry, in essence, helped Bonneville keep the cost of power low, especially for its "preference customers": the publicly owned local utility districts that distribute power to the businesses, farms, and residences in most of Washington and significant portions of Oregon and Idaho. In addition, 25 percent of the power sold to the industry was interruptible, providing the region's hydroelectric system with a substantial reserve in the event of low water within the Columbia River system. The aluminum companies, meanwhile, enjoyed the bounty of some of the lowest cost power in the United States.

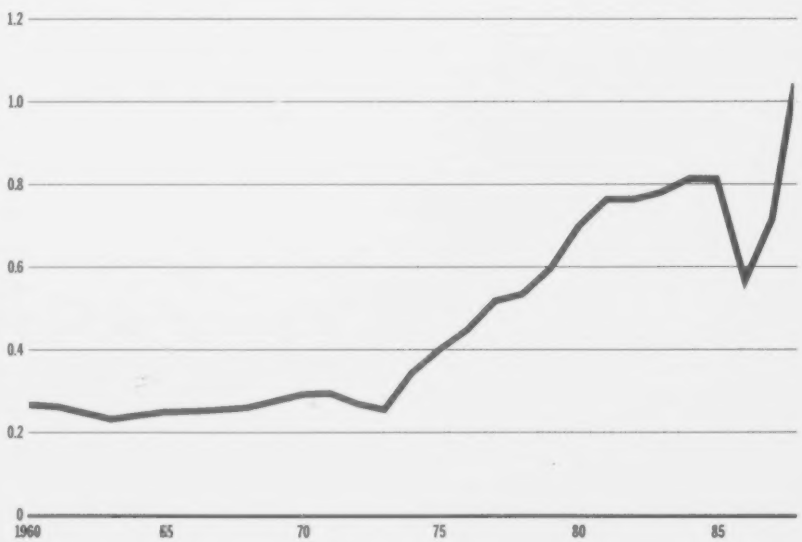
This comfortable relationship began to change noticeably by the mid-1960s. It was apparent that expansion of the Pacific Northwest's hydroelectric system would be limited and that additional power would have to come from other resources, such as nuclear or coal-fired thermal power plants. In 1968 the BPA and the region's utilities formulated the Hydro-Thermal Power Program. Under this 20-year plan, which included the construction of as many as 10 nuclear facilities, higher cost thermal power would be averaged in with low-cost hydroelectric power, and the Columbia system would become the region's source of "peaking" power. (Thermal plants are most efficient when operated steadily; hydroelectric turbines can be turned on and off readily—at least in principle.) While the cost of power to BPA's customers would rise, it was expected to do so gradually, and the aluminum industry in particular would not be faced with immediate or disastrous rate increases. Investor-owned utilities, meanwhile, were informed that their contracts with BPA for firm power would not be renewed in the early 1970s; these utilities could replace the power they had been purchasing from BPA with thermal power at a cost of 5 or 6 mills per kWh.

One critical issue in the Hydro-Thermal Power Program was the method for financing new facilities. The BPA is limited by law to the marketing of power and, unlike the Tennessee Valley Authority, cannot fund, construct, or own its plants. To promote the financing and construction of thermal capacity by the public utilities, the BPA developed the system of "net billing." Under this approach, the BPA credited each preference customer's account with the costs it incurred by participating in thermal facilities in exchange for that customer's share of the power when and if it was generated. The umbrella agency that covered most of the public utilities that participated in thermal power development was the Washington Public Power Supply System, an agency established in 1957.

The WPPSS downfall and other events during the 1970s had a dramatic impact on the Pacific Northwest aluminum industry. Just as the investor-owned utilities were turning to coal-fired thermal power, in late 1973, the energy crisis struck. The electric bills of customers served by these utilities rose sharply, which increased the pressure to create more public utilities with BPA preference status. The Oregon legislature, for example, created the Domestic and Rural Power Authority, a paper utility designed to gain preference customer status for investor-owned utilities.

In 1976 the BPA notified its preference customers that it would not be able to serve all of their needs after 1983 and told the aluminum industry that its power supply contracts, which were to expire in the mid-1980s, would not be renewed. At the same time, it was becoming increasingly apparent that low-cost nuclear power from the WPPSS plants would not be delivered on

Figure 1: Annual Average Price of Aluminum Ingot
in dollars/pound



SOURCE: American Bureau of Metal Statistics

time and, furthermore, that it would be more expensive than originally estimated. And concerns over rapidly dwindling migratory fish runs in the Columbia system were placing additional constraints on the dams that operated strictly for power output.

In the ensuing scramble for an increasingly scarce resource—cheap hydroelectric power—the aluminum companies fought to retain access. Although the demand for aluminum had weakened in the mid-1970s due to the impact of higher energy costs on both the world economy and aluminum prices, it strengthened again in the late 1970s. At the same time, smelting capacity rendered uneconomic by higher energy costs was being idled. Aluminum prices, which had remained within a few pennies of 25 cents per pound between 1960 and 1973, began to increase rapidly in 1974 and reached 90 cents per pound in early 1980. Power costs, given the rise in aluminum prices, could go up considerably from the 2 to 3 mills per kilowatt-hour the companies were then paying and still be a bargain. What the industry could not tolerate was the prospect that power availability would be sharply curtailed.

When the basic agreements that were to form the Pacific Northwest Electric Power Planning and Conservation Act of 1980 were outlined, the aluminum companies were able to maintain access to BPA power by underwriting the key feature of the power planning act—the residential exchange. Under the terms of the act, investor-owned utilities would bill residential, small-business, and agricultural customers as if the power had been purchased from BPA at preference customer rates. Any difference between the BPA's rate and the utility's own cost to generate the power would be made up by the BPA. To guarantee their access to power, the aluminum companies agreed to pay a premium of 2 to 3 mills per kWh (about $400 million) to subsidize the cost of the exchange. The act, in effect, changed residential customers in the BPA service area into preference customers, compliments of the aluminum industry.

The Changing Economics of the Industry

Throughout the 1950s and most of the 1960s, the reduction of primary aluminum was ruled by a worldwide oligopoly of six companies: Alcoa, Reynolds, and Kaiser in the United States; Alcan in Canada; and Alusuisse and Pechiney Ugine Kuhlmann in Europe. These firms owned or controlled almost all the active bauxite mines and alumina processing plants and more than 70 percent of the world's aluminum smelting capacity. In the United States, the three principal companies owned 88 percent of capacity in 1960.

During the 1960s, the price of aluminum moved within a very narrow range, showing only a slight upward trend (Figure 1). And even though demand was growing rapidly, capacity demonstrated a remarkable ability to keep pace (Figure 2). The surges in capacity and fluctuations in price that commonly typify dynamic growth in a competitive market were notably absent.

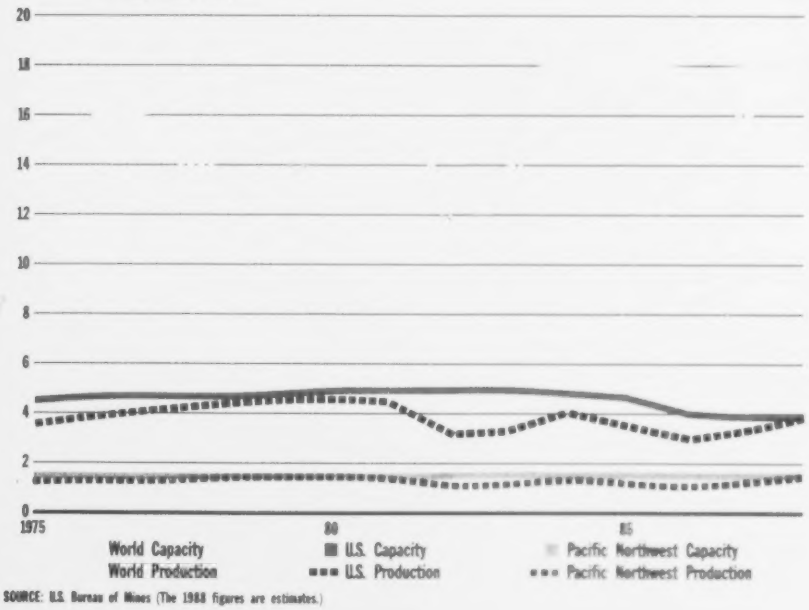
This amicable capacity-demand arrangement within the marketplace was the result of the significant economies of scale that existed in mining and processing bauxite and the high capital costs of the typical pot line aluminum smelter. But as the market for aluminum expanded, in the early 1970s, the opportunities for competition became apparent. A number of countries built hydroelectric systems to spur economic development and considered aluminum reduction as an opportunity to export "solid electricity." From 1971 through 1973, world capacity grew somewhat more rapidly than production and the price of aluminum declined slightly—even as the value of many other commodities rose sharply.

With the sudden increase in energy prices that began in late 1973, however, the price of aluminum ingot went from 26 cents a pound to as much as 43 cents in less than a year—a rude shock to the industry's customers. The economy went into its deepest recession since the 1950s, and the United States began to disengage itself from the Vietnam conflict. The demand for aluminum dropped sharply, and worldwide production fell for the first time in almost 20 years. Most of the 10 percent decline was borne by smelters in the United States, where the pot line equipment was older and less efficient, and the price of electricity from thermal plants generated by fossil fuels had gone up rapidly.

Capacity continued to expand and, by 1976, exceeded production by 20 percent, a situation that had occurred only once before—during the demobilization after World War II. By the time that demand recovered in the late 1970s, much of the older capacity had been idled because it could not be operated economically. With capacity increases prohibited by high electricity costs, prices rose rapidly, reaching 90 cents a pound in early 1980.

The well-ordered marketplace of the old oligopoly had, by the 1980s, been invaded

Figure 2: Aluminum Capacity and Production
In millions metric tons



SOURCE: U.S. Bureau of Mines (The 1988 figures are estimates.)

by new entrants, many of which were motivated less by profit than by the opportunity to earn hard currencies and sustain employment. The higher value of aluminum and heightened environmental awareness led to increased recycling, which further moderated the demand for new smelting capacity. And, finally, it was increasingly apparent that the aluminum market, at least in the United States, was on a growth path more typical of a mature industry.

Aluminum in the 1980s

For most of the 1970s, the smelters in the Pacific Northwest had been relatively isolated from the impact of changes elsewhere in the industry. Throughout the 1975 slump, smelters operated at near-capacity levels, and they were constrained only by the power interruptions created by the 1977-78 winter drought. Although BPA rates had risen from 2 mills per kWh to 3 mills, the region's power costs were still a fraction of those elsewhere. The rates of the Tennessee Valley Authority's aluminum customers, for example, were approaching 25 mills and would eventually reach 37 mills.

In 1980, under its net billing arrangement with WPPSS, the BPA began paying on the bonds to finance Power Plants 1, 2, and 3. In 1982 the direct service rates required to fund the residential exchange went into effect. As a result of these two programs, the cost of power to the aluminum companies jumped from 3 mills in 1979 to an average of 27 mills.

The United States was, at the same time, experiencing the worst recession since the Great Depression. Aluminum demand slumped, inventories were rapidly built up, and the price of aluminum dropped from 90 cents a pound in early 1980 to less than 60 cents by 1986. For the first time in their history, Pacific Northwest smelters began curtailments for economic reasons. The region became a swing producer: plants could operate only when the price of aluminum was high enough to cover variable costs. Because of the maintenance costs and the age of the smelters, the high-priced wage and benefit packages built into existing labor contracts, and the prospect that BPA rates could only go higher, several smelter owners began to consider permanent shutdowns.

For the BPA, such a decision would have been disastrous. Back in 1975, when Seattle was considering participation in WPPSS Plants 4 and 5, the city council had commissioned an examination of the economics of the proposed plants. The study's authors predicted that the increases in electric rates needed to pay for the nuclear power plants would depress the demand for electricity to a point where WPPSS 4 and 5 would be unnecessary. In fact, WPPSS 1 and 3 were also moth-balled, and the region still had a substantial power surplus. Idled aluminum smelters would have made the surplus almost unmanageable.

The BPA's market for surplus power was limited by the size of the tie line to California, by oil and gas prices, and by the terms of its agreements with other utilities. At best, the BPA could hope to realize 15 to 20 mills per kWh on power sales outside the region, and even then there was not enough transmission capacity to handle the load that would be created if large blocks of aluminum company power went off line. The BPA decided instead to reconsider the cost allocation scheme of the residential exchange and to formulate a long-term program for retaining the aluminum industry's business.

The first step in the reevaluation process was for the BPA to grant the aluminum companies emergency discounts in 1982 and 1983, while reviewing the terms of the residential exchange. Once that process was completed, power rates to the aluminum manufacturers were reduced by 5 mills per kWh in exchange for their commitment to use a total of 2,650 megawatts of power in 1984.

Aluminum prices flattened out in the early 1980s as demand fell. At this point, a number of companies concluded that aluminum production in the Pacific Northwest was no longer economically viable and made the decision to leave. Arco arranged a management buy out of the Columbia Falls smelter in 1984. In 1985 Martin Marietta sold its Goldendale smelter to Commonwealth Aluminum, an Australian company, and shut down its plant at The Dalles. That facility was then leased to a local management group, which planned to reorganize and restart the smelter with reduced overhead and new labor contracts. The following year, Alcoa closed its Vancouver smelter during a strike, and Commonwealth shut down Goldendale.

After a lengthy analysis of its alternatives, the BPA, in mid-1986, instituted a 10-year variable-rate program, which allows rates to fluctuate with aluminum prices, and a conservation modernization program to improve the efficiency of the smelters. The intent of these marketing programs was to modify the aluminum industry's cost curve so that shutdowns would not be price-motivated.

The timing of the Bonneville Partnership programs could not have been better, at least in the short run. Aluminum prices began to recover strongly in 1986, and, with the vigorous economic growth of the mid-1980s, the demand for aluminum caught up with world capacity. In 1987 the Vancouver and Goldendale smelters, under local management, reopened in time to participate in the aluminum boom. Prices reached an all-time high in early 1988, and the BPA began charging peak rates in November 1987.

The Industry and Its Prospects

At the threshold of the 1990s, the primary aluminum industry in the Pacific Northwest is a substantially different activity than it was a decade ago. Ultralow-cost power is no longer a possibility, and a broad array of factors—some positive, others negative—will determine the industry's future.

The most positive element in aluminum's outlook is the variable-rate structure. According to BPA estimates in the spring of 1986, the short-term operating costs of Pacific Northwest smelters ranged between 49 and 57 cents per pound, given BPA's standard industrial rate of 22.8 mills. The variable rate now drops 1 mill for every 1 cent decline below 61 cents per pound. At 53 cents per pound, the rate stabilizes at 15 mills. Conversely, when aluminum prices rise above 72 cents per pound, BPA rates also move upward. At 78 cents and above per pound, the variable rate totals 28.8 mills.

In addition to the changeable rate structure, the BPA allows for variation in the other costs of the aluminum smelters, such as the price of alumina, by establishing pivot points so that the high and low points of the rates can be adjusted every year. This, in fact, was done in both 1987 and 1988, and the pivot points are now set at 67 and 75 cents per pound.

At present, BPA's sliding scale means that even the higher cost smelters can continue to operate without losses for substantial periods—as long as aluminum prices remain above 55 cents per pound. And, since most U.S. smelters would function at a loss below 60 cents per pound, Pacific Northwest smelters, which are no longer paying the full costs of the residential exchange, hold some small

advantage. The problem with this arrangement, from the point of view of the aluminum companies, is that the lower end rate increases 1 mill every other year, and the whole rate schedule is subject to upward revision if the Bonneville Power Administration's average rates rise. Not only is the downside protection provided by the rate schedule diminishing, the entire program comes under review for recalculation in 1991.

Under the conservation modernization program, BPA will finance a variety of improvements in smelter efficiency—refinements that are expected to reduce the aluminum load by 7 percent and lower production costs by about 2 cents per pound. This program will be spread over several years, however, so its full impact will not be realized until the early 1990s.

Another factor in the industry's favor has been the reduction in production labor and overhead costs. In the 1970s, the industry employed 12,000 workers in Washington, Oregon, and Montana. This total has been reduced to less than 9,000, and a number of labor contracts have been renegotiated to include profit-sharing provisions, which further reduce costs when market prices are low.

In addition, three of the four Northwest smelters to reopen under local management are "tollers." Instead of purchasing alumina and selling aluminum ingot in volatile markets, these smelters process the alumina of other companies for a fee. Since these agreements are usually long-term contracts, the market risk for the smelters is minimized. The three tollers operate about 20 percent of the region's capacity.

The steps that the aluminum industry has taken to create lower operating costs will protect it to some extent in the next market downturn. But the fact remains that aluminum may now be a mature industry, with few new markets to penetrate, with serious competition from plastics in some of its traditional product areas, and with metal-saving technology on the horizon. The beverage can and food packaging markets appear saturated in the United States, vinyl siding for houses has been outselling that made of aluminum for a number of years, and increasing amounts of plastic are used in packaging and appliances.

For a number of years, too, the standard weight of the aluminum sheets used in beverage cans, household foil, appliances, and automobiles has been reduced, and this trend toward downgauging, which lessened aluminum demand by as much as 5 percent in the late 1970s and early 1980s, shows every sign of continuing. In fact, the high current price of aluminum may, in the long run, be the industry's worst enemy because it increases the incentives for substitution and downgauging. And once companies invest in an alternative packaging material or in processes or designs that use less metal, there is little likelihood that they will return to their previous materials or designs should prices drop again.

The impact of recycling on the demand for primary aluminum has also been noticeable. In 1972 secondary aluminum—in the form of scrap from the manufacturers of aluminum products—constituted 21 percent of U.S. consumption. Throughout the 1970s, the energy crisis and increased environmental awareness sharply expanded recycling activity, and secondary aluminum's share has risen to 35 percent. Although recycling has its limits, the growing crisis in solid waste disposal and high aluminum prices suggest that additional recycling is likely.

For a number of countries, primary aluminum has become an excellent vehicle for converting energy resources that are not readily exportable, such as hydroelectric power, natural gas, and low-grade coal, into hard currencies. In Canada, Australia, Brazil, Venezuela, New Zealand, Norway, Indonesia, Africa, and the Middle East, aluminum is primarily an export industry. Power costs are low, smelters are usually large, modern, and efficient, and labor costs are often minimal. As long as the price of aluminum remains above 65 cents per pound, new smelters in many of these countries constitute excellent investments. More importantly, the variable costs of the newest smelters can be covered even if aluminum falls to less than 40 cents per pound. With long-run demand growth likely to remain slow, however, the addition of even two or three 300,000-ton smelters could quickly alter the world's current balance between supply and demand.

Even in the absence of new capacity, the price of aluminum could fall very rapidly if there were a slowdown in the world economy. As in many continuous-process industries, the only efficient level of operation for an aluminum pot line is at full capacity. In addition, pot lines cost about $20 per ton of capacity to shut down and restart, so every producer has a strong incentive to run at full capacity as long as possible before prices make a shutdown mandatory. With even a small reduction in demand, inventories of unprocessed aluminum held by producers and fabricators, which typically run between 30 and 35 percent of consumption, begin to rise quickly. Each producer hopes that someone else will cut production first as the price starts falling. But with the large number of producers operating in the current international market, prices can easily drop below 45 cents per pound before enough production is curtailed to reduce inventories.

Although a drop in price below 45 cents per pound would probably be short-lived, aluminum could linger for some time in the doldrums below 60 cents per pound if new capacity comes on line. At that price level, most existing smelters could continue to operate, but, with sluggish growth in long-term demand, it might be some time before supply and demand are better matched.

When the Surpluses Disappear

On balance, the changes in the cost structure and market position of the Pacific Northwest's smelters have improved their market position. As long as regional power surpluses continue—and they are expected to do so until the mid-1990s—and the variable-rate schedule remains near its present levels, most of the smelters will be economically viable into the 1990s. Not only will their success benefit consumers of electricity throughout the region, it will be essential to the vitality of the many small communities—Goldendale, Ferndale, Wenatchee in Washington, Columbia Falls in Montana, and The Dalles and Troutdale in Oregon—that depend heavily, if not exclusively, on the payrolls that the smelters generate.

It is inevitable, however, that the region's power surpluses will begin to disappear in the mid- to late 1990s. At that time, difficult decisions will have to be made. Although WPPSS Plants 1 and 3 are probably the least expensive increments of new generating capacity available to the Pacific Northwest, public opinion and the price tag of $1.5 billion each may not permit the completion of those facilities. (Current completion estimates for each 800-megawatt unit total 20 mills per kWh—excluding the addition of operating costs, inflation, and likely cost overruns.) Regardless of the source of new electrical capacity, however, its availability will directly affect the future of the aluminum industry in the Pacific Northwest.

The United States–Japanese Trade Accords and the Outlook for Pacific Northwest Beef Producers

by John B. Frazier

The United States–Japanese beef trade has been hindered by protectionist measures, such as tariffs and quotas, since its inception in the late 1950s. As a result of new trade accords between the two countries, Pacific Northwest beef producers are optimistic that the near future holds favorable and challenging opportunities for the beef industry. The Northwest is in an excellent position, both geographically and culturally, to benefit from the changes in this expanding and promising arena.

In the early 1900s, the United States's beef industry was highly centralized, and the largest four companies—ConAgra, Exel, Iowa Beef Processors (IBP), and Swift Independent—controlled 55 percent of the market. In the 1950s, technological improvements in transportation and refrigeration and increased energy efficiencies resulted in a decentralization of the industry, and the market share of the four processors fell to less than 20 percent. The packing and processing industry became characterized by a growing number of firms that were scattered according to the location and density of livestock production.

The beef packers, in an attempt to create greater pricing efficiency within the industry, lobbied the federal government to establish grading standards. Originally, these grades were implemented to facilitate ease of trade within the beef market. Consumers, however, adopted the industry classifications of prime, choice, and select as preferred brand names. As a result, the industry has seen an increase in the demand for beef that has been graded prime and a decrease in the sale of beef that has been classified choice or select.

In years past, meat plants were located near railroad terminals, and most facilities, out of necessity, handled cattle, hogs, and sheep. As improvements in transportation, communication, and refrigeration, and uniform grading standards came along, auction markets and direct marketing superseded the railroad markets, and slaughterhouses became highly specialized operations that dealt with a single species. In the late 1950s, the use of auction markets began to dwindle, and direct purchasing, which enabled producers to deal independently with buyers, became the norm. With the elimination of the auctioneer-middleman, pricing and buying methods also changed.

> Northwest beef producers are optimistic that the future holds favorable and challenging new opportunities for the industry.

At one time, buyers and sellers met at the cattle pens and agreed on the price of a living animal, which was then processed. Now, instead of evaluating the product "on the hoof," buyers wait until the packers have slaughtered, weighed, and graded the animals before negotiating a price. The buyer is able to evaluate the quality of the product more accurately, and the producer, depending on market conditions, may receive a higher price due to the elimination of the middleman.

Today's Market

The cattle market can be divided into cow-calf, stocker, feeder, and packer operations. Cow-calf enterprises care for young animals through their eighth or ninth month. The calves are then purchased by the stocker operators, who feed the animals on grass until they are between 12 and 18 months old, at which time they are sold to the feeder and moved to a feedlot. The cattle remain in the feedlot for approximately three months and then are sold to the processor, who butchers them and packages the meat for either domestic consumption or export.

There are more than one million stockers and feeders in the United States. Most of them are in the Southeast and Northcentral regions; more than one-third are located in the Corn Belt. As with other agricultural industries, fewer cattle producers are now raising more animals on larger operations. Three companies, for example—Iowa Beef Processors, Exel, and ConAgra—handle more than 80 percent of the beef cattle total.

For processors, ensuring a constant supply of animals is the primary concern. The IBP plant in Wallula, Washington, for instance, processes nearly 2,500 head of cattle every day. As a safeguard, IBP has started feeding

its own cattle instead of relying totally on area feeders. The large processors have successfully excluded potential entrants to the market by minimizing their own assembly and processing costs. For new firms, the competitive disadvantages and the inevitability of large capital outlays have restricted market opportunities.

The Accords

As a result of the United States–Japanese trade accords, we should see expansion within the foreign beef market and new opportunities for the Pacific Northwest's beef growers. "Both the Japanese consumer and the U.S. cattleman will benefit," says Dale Humphrey, the president of the National Cattlemen's Association. The Japanese consumer will benefit from lower prices, and the U.S. producers will profit from an expanded foreign market. The potential for favorable opportunities within the beef industry, however, can only be realized if the industry makes a long-term commitment to compete in this overseas market.

The U.S.–Japanese trade accords, which are the result of months of tough negotiations between the United States Meat Export Federation (MEF) of Denver, Colorado, and the Japanese Livestock Industry Promotion Commission, redefine many of the quotas and tariffs that have impeded free trade between the two countries. Japan's reasons for protectionist measures included the defense of its own infant beef industry, the need for government revenue, national security, and self-sufficiency, as well as the pressure of politically strong Japanese agricultural producers. The new accords, which were finalized in April 1988, provide some relief to the level of Japanese government intervention in international agricultural markets.

Under the trade accords, Japan will have a three-year period, from 1989 to 1991, to eliminate its global beef import quotas. During that time, Japan will raise its quotas by 60,000 metric tons (132 million pounds) per year. (In 1987 the Japanese imported 214,000 metric tons of beef; in 1988, 274,000 metric tons.) Now that the door to this market is opening, it will be up to U.S. producers, packers, and processors to build a larger market share. The United States Department of Agriculture, for its part, estimates that beef exports could double to more than $1 billion per year.

The accords eliminate the distinction between grain- and grass-fed cattle, and the separate quotas that had been established for both categories. The new trade agreements regulate the total quantity of beef imported, not the type of feed used to raise the animal. The accords also contain a provision that limits the competition between imported table beef (steaks and hamburgers) and Japanese Kobe beef (the thin strips of highly marbled meat used in stir-fry recipes). This proviso institutes separate pricing schedules for the two types of beef, and the end result should benefit the Japanese consumer. At present, the retail price of beef in Japan is three times the wholesale price, and import tariffs are 130 percent. A Japanese consumer, for example, pays more than $40 for a steak prepared in a restaurant. Under the accords, import tariffs will be reduced to 70 percent by 1991 and to 50 percent by 1993. This tariff reduction will help streamline the distribution system by making beef more accessible to consumers, by lowering retail prices, and by boosting demand.

The U.S.-Japanese trade accords redefine many of the quotas and tariffs that have impeded free trade between the two countries.

Opportunities for the Pacific Northwest

As Japanese economic growth and consumer spending continue to increase, supermarket sales and restaurant food consumption have multiplied. Hotel accommodation capacity has increased by more than 25,000 rooms since 1985.

Japan produces 500,000 tons of beef per year, which meets about half that country's demand for meat. According to Mark Gustafson, the vice president of technical services and research for the U.S. Meat Export Federation, an international market development organization, the Japanese would like to maintain that 50 percent sufficiency level in beef production, but have no ability to increase domestic production. Japan's land and feeding opportunities are already constrained. Increases in the demand for beef in the Japanese market, therefore, will have to be served by foreign producers. The United States currently supplies 35 percent of the beef that Japan imports, and U.S. beef producers hope to supply 50 percent of total imports as a result of the trade accords.

The per capita consumption of beef in Japan is, relative to the United States, much lower. In the late 1970s and early 1980s, the typical American consumed 72 pounds of beef per year, while the average Japanese ate only 12 pounds. As a result of MEF–sponsored beef information and advertising campaigns in Japan, the 1988 figures show that the Japanese now consume more than 20 pounds of beef per person.

The Meat Export Federation has been active in Japan for the past 10 years, working to improve consumer and trade awareness. These efforts, in coordination with the trade accords, will yield an expanded overseas market for Northwest producers. In fact, MEF's campaigns have already improved the image of U.S. beef in Japan: the organization's polls indicate that the Japanese now hold a greater appreciation for the quality of United States beef. And Japanese consumption of steaks and hamburgers is on the rise.

Geographically, beef producers in the Pacific Northwest hold a clear advantage over producers in other regions. The Northwest's proximity to the Pacific Rim ports of Seattle and Portland grants producers lower surface transportation costs. This advantage is lost when air transportation is used; the cost of air freight from Chicago to Tokyo, for example, is nearly equal to that from Seattle to Tokyo.

The Japanese, too, recognize the advantage of lower surface transportation costs. Farmland Trading, a subsidiary of a large Tokyo-based food importer, recently purchased Washington Beef, Inc. The MEF's Gustafson anticipates that this acquisition will be only one of the first of "large increases in export-related joint ventures and investments." These joint ventures, however, will not be between Japanese and U.S. beef

producers. The participants will be Japanese investors with the financial resources necessary to buy packing plants and U.S. processors. Frank Falen, the executive secretary of the Washington Cattleman's Association, says that "new plant ownership should provide an economic shot in the arm for cattle ranchers in the Northwest."

Fluctuations in exchange rates have made U.S. investments, particularly land, more attractive to the Japanese investors. Dave Woolridge, an executive of an Austin, Texas-based export company, says that "Japanese investors are likely to restrict their investments to West Coast states because they feel more comfortable with the local culture and the geographic location."

Markets and Risks

Marbling, or intramuscular fat, gives beef its distinctive flavor. The degree to which a particular animal is marbled depends on its age and the length of time it spends in the feedlot. The longer an animal is in the feedlot, the higher the degree of marbling. Each animal marbles in its entirety, and the whole animal must conform to the standards of the particular market. Unfortunately, only 25 percent of the animal can be sold as prime or high choice—the cuts most in demand.

Differences in tastes and preferences exist between American and Japanese consumers. Both the United States hotel-restaurant industry and the Japanese consumer demand the highly marbled prime or very high choice cuts of beef. The American grocery shopper prefers the more lean, less marbled choice cuts.

The Japanese have traditionally eaten Kobe beef, the thin strips of high-fat, flavorful meat. This type of beef is produced by labor intensive methods. Carefully chosen English breeds of calves are kept in very small pens that prohibit an animal's movement. For three years, the cattle are fed a high-roughage diet and are hand massaged daily. This daily attention and the additional feeding requirements explain why the labor costs to produce Kobe beef are so high.

To produce lean beef, U.S. cattle feeders keep animals in the feedlot for about 120 days; for more highly marbled beef, cattle spend from 150 to 180 days. According to Wallace A. Rehberg, an agricultural economist and extension agent from Washington State University, each animal costs approximately $1.10 per day to feed. So, for the feeder to maintain his cattle an extra 30 to 60 days, he must pay an additional $33 to $66 per animal. Many feeders believe that they are taking a tremendous risk in producing highly marbled cattle for the Japanese because of these higher costs. The packing houses, they say, won't pay them enough to cover the extended feedlot expenses.

Prior to the trade agreement, U.S. beef producers viewed the Japanese export market as a high-risk one, due to the uncertainty associated with foreign government policy changes. With the expansion of the quota, some of the uncertainties will diminish.

As the Japanese demand for selective cuts increases, U.S. consumers may find the domestic prices on those lean cuts climbing.

Many U.S. feeders, however, are still reluctant to change their feeding methods to meet the requirements of Japanese consumers.

The large processing companies—IBP, Exel, and ConAgra—have already started jockeying for position in the race to capture a sizeable share of Japan's market. Feeder operators who are willing to forward contract with the packers will be able to lock in a guaranteed price and eliminate a portion of their risk.

Dave Stelfox, the chief executive officer of Washington Beef anticipates that the most "significant change to our end of the industry will come when feeders start participating in genetic selection and custom-feeding cattle to produce the grades the Japanese want." Feeders who attempt to supply this market, he states, should select cattle that are genetically predisposed to marbling. At present, orders from the Japanese are being turned down because U.S. feeders are unwilling to do this.

If United States producers aren't responsive to the Japanese market's demands, those needs will be satisfied by the Australians or by the Japanese business people who have the financial resources necessary to purchase U.S. beef operations. The MEF's Gustafson predicts that the Japanese will move into the United States's feeding industry. The accords, he says, will improve trade between the countries and two things will happen. Japanese investors will begin producing, in the United States, the type of beef the Japanese consumer wants, and the Japanese will start accepting lower grades of U.S. beef as a result of greater health consciousness. As the Japanese demand for selective cuts increases, U.S. consumers may find the domestic prices on those lean cuts climbing.

Australia, our primary competitor in the Japanese beef market, will be limited in its ability to benefit from the trade accords, because its 60 percent market share is predicated on the processed meats (sausage and bologna) industry. Since the trade accords loosen restrictions only on specific cuts (loins, shoulders, ribs, and rumps), increases in quantities of processed meats are likely to be much smaller than increases in these imports.

Changes in export markets as a result of legislation or revised agreements rarely take place overnight. It will take several years for U.S. producers to feel the effects of the accords. A more timely question for these producers is how long it will take before the Japanese consumer prefers table beef. Fortunately, the producers who may be in a position to take advantage of these changing regulations and consumer preferences have some time to perform in-depth analyses of the costs, risks, and opportunities. Beef producers—and Pacific Northwest producers in particular—will have the time to prepare themselves and their operations for potential gains from the accords.

As a result of the new agreements, Japan's rapid economic growth, and the marketing campaigns of the U.S. beef industry within Japan, a much larger percentage of Japanese consumers are eating more table beef and relatively less Kobe beef. With the accords, the potential exists for a much larger export market in Japan. It is the responsibility of the men and women involved in the U.S. beef industry to ensure the longevity and expansion of the current Japanese buying trend.

John B. Frazier is an agricultural economist.

The Farming Business: A Washington State Profile

by Jack Whelan

LAURIE BELANUS ODELL

A hundred years ago, 60 percent of the country's population worked on farms; now less than 5 percent do. Millions of farmers left their land during the depression, and, in the 1950s and 1960s, another seven million farmers pulled up stakes, taking their families with them, depopulating rural areas and crowding into the nation's cities. But, while the number of farmers has fallen steadily, agriculture as an industry has remained a virtual powerhouse.

Farmers and related agricultural industries—from food processing to the manufacturers of farm equipment—contribute more than any other industry to the American economy. Agriculture accounts for 20 percent of the gross national product and employs more people than the steel and automobile industries combined. In Washington State, agricultural production at the farm level was $3.06 billion in 1986, and, once the contributions of other agriculture-related industries were added, sales at the consumer level exceeded $8 billion. Agriculture in this state is a bigger industry than either aerospace or forest products.

American farmers, though significantly reduced in numbers, continue to play a foundational role in our economy and culture. But because there are so few farmers now, says Walla Walla-area farmer Bill Schwerin, Americans have lost the "farm connection."

"People no longer have a clear sense of what a farmer does," Schwerin states. "Not so long ago, even city folks had someone—a father, grandfather, an uncle—who was a farmer. That's not so any more." The relationship that nonfarmers have with farmers has become distant and abstract. Too many city dwellers think of farmers in the same stereotypical terms that they reserve for a foreign culture. When many of us think of

farms now, images either nostalgic or condescending come to mind. We see the hayrides and barn dances and the warm community life missing in our cities. We imagine slopping the pigs and picture slow-witted bumpkins in bib overalls who have blades of straw in their teeth. It's the wide-opened, depopulated spaces that, no matter where you are, seem to be the middle of nowhere. But these mental impressions are as misrepresentative as thinking of wooden shoes and windmills when someone mentions Holland.

Whatever our image of him or her, the family farmer represents something to us that we'd rather not give up. But instead of using the farmer simply to fuel our nostalgia for a more simple, more pure America, it's important that we clearly understand the life of the modern-day family farmer, and how it has changed so dramatically since the early 1970s. What does he produce? How does he live? What motivates him?

Washington Agriculture: A Bird's Eye View

Before focusing on the details of family farmers, and the role they play in small communities across the state, it may be useful to get a feel for the big picture. Consider these statistics:

- Farms cover 16 million acres in Washington, and this acreage total represents about 16 percent of the farmland in the United States.
- Of the 2,159,000 farms in the United States, 38,000 are in Washington. This number is actually up from the mid-1970s, when there were 34,000 farms. Most of the increase has been on either very small farms or very large farms. The middle-sized farms are steadily being squeezed out.
- The small operations are called "hobby" farms by some, because the main income source for their owners is off the farm. According to *Successful Farmer* magazine, small farms that gross less than $40,000 per year total one-third of American farmland.
- The farms in the top 20 percent, in terms of size, account for 80 percent of the production and earn from $200,000 to $500,000 in gross sales. Because profit margins are so slim, a farmer typically needs to gross $200,000 to have an income of $20,000.
- Farms owned by large absentee corporations account for only 3 percent of the nationwide total and an even smaller percentage than that in Washington. Agribusinesses are not snapping up the farmland made available by failing family farmers. Neighboring farmers are buying that land in an attempt to increase their production and gross sales.
- Farmers in Washington rent, on average, 30 percent of their land. According to Bill Schwerin, rental fees in the Walla Walla area typically cost 30 to 40 percent of gross sales, while the cost of owning land generally represents 40 to 50 percent of gross.
- Most farmers do not receive federal subsidies, and those who qualify for them don't get rich on them. Washington producers derived 8 percent of their income from government support payments, and most of the checks went to wheat and dairy farmers. The government does not support the fruit, vegetable, or livestock growers.
- The top six commodities produced in Washington—milk, apples, cattle and calves, wheat, and potatoes—accounted for 63 percent of the total value of farm sales in 1986.
- Only 25 percent of Washington farm production is sold in-state. Another 50 percent is sold in other states, and 25 percent is marketed internationally. Eighty percent of Washington's wheat crop is sold on international markets.
- Washington is this country's leading producer of hops (75 percent of the total crop), apples (46 percent), sweet cherries, processing carrots, and red raspberries. The state comes in second in fall potatoes, pears, apricots, grapes, and asparagus. It is the fifth largest producer of wheat and ranks ninth in the production of milk.

Back to Earth

Pat Wandling is an endlessly resourceful and inventive dryland wheat farmer in the Horse Heaven Hills southeast of Yakima. His grandfather homesteaded at the turn of the century, and his Aunt Gladys, now in her 90s, will tell you stories about coming across from Walla Walla in a covered wagon and describe the ordeal of crossing the Columbia on a crude platform ferry. Wandling is old enough to have lived through the Great Depression and to have seen the advent of intensive mechanization and government subsidies. His family used mule-drawn plows and harvesters until 1939, and the farm didn't have an electric line until 1948.

Wandling and his brother Lyle own or rent 13,000 acres, and, in their partnership arrangement, Pat manages the wheat production and Lyle, the cattle breeding. In years past, about 3,600 acres were committed to wheat cropland—each year half was planted and half was left fallow. Much of this land is now completely out of production, in accordance with the U.S. Department of Agriculture's Conservation Reserve Program. Created as part of the 1985 Farm Bill, this program was designed to take 40 million acres nationwide out of production in order to reduce grain surpluses and to retard erosion, which in this state—and especially in the hilly Palouse—is a serious problem. Conservationists estimate that for every ton of grain harvested, 10 tons of topsoil wash away.

Farmers in the Horse Heaven Hills area are always struggling with near-drought conditions; their farms average only 6 to 8 inch-

es of rain annually. During this past summer of nationwide drought, Wandling says that his farm had no rain for 92 days—but the year before he went 108 days without rainfall. As a result, the yield in this westernmost sector of the Washington wheat belt is significantly lower than that in the moist regions farther east, where precipitation is the 20- to 30-inch range. The tradeoff is that the cost of this dry land is often 75 to 80 percent less expensive.

Growing wheat without irrigation in such an arid land is a tricky business. In the dry years, like these most recent ones, farmers have to "drill" their wheat seeds 6 inches into the earth to find enough moisture for them to germinate. Then wheat growers pray that it does not rain again until the seedlings break the surface. If it rains and the surface forms a crust as it dries, the seedlings can't break through. They curl back under and die.

In some years, the moisture level is so low that Wandling can't reach it with his drills, so he waits until fairly late in the fall to sow the wheat in the surface dust. If the rains come in moderate amounts, the seeds won't be washed away, and if they come early enough, the seeds won't blow away and will have a chance to root deeply before a killing frost.

Last fall, Wandling, faced with the same dry soil conditions, experimented for the first time with a rig he invented in the hope of finding a less risky planting method. His seed drill now carries a tank of water, with lines that follow each drill into the soil to release moisture around the seed at the same time it's sown. It worked.

After the seedlings come up, the wheat farmer hopes that snow comes before the ground freezes. The snow acts as an insulator to keep the soil soft and porous enough to absorb the melting snow in the spring. This precious moisture will otherwise run off, taking with it a significant amount of the topsoil.

Despite the drought in the summer of 1988, some farmers, like Wandling's neighbor Steve Nought, did extremely well, because the ground didn't freeze last winter and the spring weather was cool. In 1988 Nought had a record barley crop and his second largest wheat harvest.

The Subsidies Quagmire

Ninety-five percent of all wheat farmers, including Pat Wandling, participate in the government's various subsidy programs. Every year, for example, the federal government, through its price support programs, sets a target price for wheat, which guarantees payment at a level that is supposed to ensure that the average farmer does better than break even. Wheat price averages are then taken for a five-month period during the spring and summer. The farmer receives the difference between the average market price and the target price in a deficiency payment. In 1988, for example, the target price was $4.23 per bushel; the average market price totaled $3.54. Wheat farmers, regardless of the price at which they sold their wheat, were paid 69 cents for every 1988 bushel they produced. Total price support payments to Washington farmers amounted to $233,678,890 in 1987, and wheat farmers received the lion's share with $198,690,418.

The Commodity Credit Corporation, another subsidy program, offers the farmer a loan based on the anticipated value of his crop. If the market price exceeds the loan amount, the farmer can sell the crop, satisfy the loan, and keep what's left. If the farmer can't get a market price high enough to pay back the loan, he "forfeits" his crop to the government and keeps the original loan amount, which, in effect, becomes his salary.

The idea of these and other subsidy programs, which have existed in one form or another since the 1930s, is to guarantee farmers a living wage for their hard work and to stabilize prices by ensuring a steady supply of key commodities. These programs keep farmers—and the rest of the industry that depends on them—in business. Subsidy programs also keep food prices low, because farmers have an incentive to produce as much grain as they can.

Yet nobody likes these programs. Taxpayers criticize them because they're expensive—$26 billion per year on average since the passage of the 1985 Farm Bill. Farmers, an extremely self-reliant group, don't like depending on the government. Many farmers and analysts now predict that the government will do everything it can to get out of subsidy programs in the next decade. But they also acknowledge that federal assistance programs will continue to be a part of agriculture as long as every other major agricultural exporting country maintains similar or stronger programs. Given that ours is a world market, American farmers can't compete without government support.

The Farm Crisis

Despite the safety net provided by government support programs, some farmers ran into trouble in the mid-1980s, and most farmers felt the squeeze. This crisis actually had its origin in the early to mid-1970s, when the Russian grain shortage and the droughts in Asia and Africa created an enormous demand for grain. At that time, Earl "Food Is a Political Weapon" Butz, Richard Nixon's secretary of agriculture, urged all farmers to plant from "fencepost to fencepost," and the government and the banks encouraged farmers to expand quickly—by buying as much land and machinery as they could—so that they could supply the growing world demand for grain. The price of wheat in Washington State, for example, jumped from $2.04 a bushel in 1972 to $4.89 in 1973 and stayed fairly high until 1982.

In the late 1970s and early 1980s, however, inflation and interest rates skyrocketed

and, along with them, the prices for land and machinery. Many farmers bought land, as the experts had urged them to do, for fear that prices would soar out of reach. They bought believing that their additional debt was relatively risk free, because commodity prices appeared destined to stay high. But, in the early 1980s, everything started to unravel.

Many wheat farmers regard the Russian grain embargo, which took effect in 1980, as the beginning of their problems. What frustrates farmers about the Carter administration's embargo was not the loss of sales to a primary market (in fact, 1980 agricultural exports jumped from $31 billion to $40 billion despite the embargo). Farmers argue that the embargo created a deeper and more persistent problem: it encouraged foreign competition. The vacuum created by the American withdrawal from the Soviet market was filled by Australia, Canada, and other countries, which rushed to increase their grain-growing acreage. That acreage remained in production after the embargo and became a major factor contributing to the international grain gluts that have plagued U.S. farmers throughout the 1980s.

This change—coupled with the successes of the green revolution in countries like India—generated worldwide surpluses that drove wheat prices down in the mid-1980s. The embargo also sent the message to the rest of the world that the United States was no longer a reliable supplier. Japan, which had depended almost exclusively on U.S. grain, turned to other producers in the fear that there might someday be a Japanese embargo.

The result was the farm crisis. Farmers were caught between the extremely high-interest loan payments on their expensive land and equipment and the international grain glut, which forced prices to a low of $2.51 in 1986. Ten percent of U.S. farmers went under; those who survived still felt the squeeze.

The Nought farm survived. In the early 1970s, things were going well, and Steve Nought convinced his father and brother to leverage the family's farm so that he could buy a ranch. "In 1977," he says, "there was a drought, and we had real difficulty making our payments. We were into the bank, borrowing more and more money each year, and interest rates were going up to 17, 18, then 19 percent. In the 1980s, we had excellent production years, but because the prices were so low, we were only breaking even."

The price support program helped the Noughts somewhat, but the program stipulated that 28 percent of his grain-producing acreage be taken out of production. This reduced Nought's gross sales significantly—at a time when volume on such slender margins was the only way a farmer could make it. The price support program, in effect, contributed to the squeeze.

The Management Crisis

Although good business managers like Steve Nought had a hard time surviving the pressures of the farm crisis, many farmers created additional difficulties for themselves in the 1970s by continuing to make business decisions the same way they did in simpler times. "In the past," says Washington State University Extension expert Gayle Willett, "prices, interest rates, and production and overhead expenses were stable enough so that farmers could make major land and equipment purchase decisions the way the typical family decides to buy a car. If they wanted it, and if they could get their hands on the money, they bought it. They did no detailed financial analysis. They may have prepared some elementary cash flow analysis for the coming year, but not for the long term."

Steve Nought agrees that the trauma of the 1970s and 1980s forced farmers to change their business management practices drastically. "Young men coming into farming are much more business oriented than their fathers, who didn't have to be business managers. My father made all his money by being an excellent production manager. For him, yearly prices wouldn't change more than 11 cents, so his marketing decisions were not that critical. Nowadays prices can change 11 cents in minutes."

Because there are so many factors for farmers to consider in their planning, accounting, market development, and decision-making, computers are becoming an essential tool. "Now you can play 'what if' so quickly," Nought explains. "We sit down in the fall and use the computer to project what would happen if I seed this crop or another. We check out what would happen if we were to enter a government program. You can have 10 options in front of you in minutes. Then, a few months later, I'll plug the numbers in again to see what adjustments need to be made. But perhaps the most important contribution the computer makes is helping us with a more precise figure for our production costs." With profit margins so slim and input costs becoming increasingly complex, the farmer with the computer—and with access to information about changing commodity prices on international markets—has a clear edge.

Because farmers expanded so quickly in the 1970s, their small family operations became big businesses. For the first time, many farmers sought the advantages of incorporation and, with that change, they were forced to become better business managers.

Unlike the farmers Gayle Willett described, Steve Nought plans his cash flow and investment strategy on a 10-year cycle. He expects that, in those 10 years, he will have six average production years, two below average, and two above. He outlines his finances so that his good years pull him through the bad. The problem in the 1980s was that farmers like Nought had their best production years and still couldn't make money.

Nought now uses some of the more sophisticated marketing instruments available on the futures and options markets. Like Gayle Willett, he thinks that prices will become more volatile in the next decade, especially if the world's governments consider withdrawing from the subsidies business. Prices would return to the classic boom-and-bust cycle typical of the unregulated markets of the 19th century. By hedging on the futures markets, Nought hopes that he will be able to maintain some control.

The Role of Government

Most farmers would rather live in the riskier world of volatile prices than continue to be dependent on government subsidies—as long as there are markets in which they can make money during the good years. And while everyone would like the government to withdraw from the business of supporting farmers, it's clear that the federal government can't do so without negotiating similar support withdrawals with our agricultural export competitors.

The governments of America's chief markets and rivals are even more involved in their respective agricultural economies. Within the European Economic Community, for instance, commodities flow freely, but prices are regulated so stringently that it's impossible for American farmers, or other outsiders, to undercut its prices.

Japan's policies are even tougher. It strictly regulates the entry of American commodities, and, as a result, pays food prices that have been 45 percent higher than world prices. Europeans have been paying 25 percent higher prices. Americans pay slightly below world prices and rank last in protectionist measures. Shippers from any country can enter the American market and sell cheaply.

Even if a nonsubsidized free market for agricultural products were to become a reality, the government would always be a fairly intimate partner in the farmer's business. Bill Schwerin thinks that farmers who want farming to be a free-enterprise endeavor are deluding themselves. "The way I see it," he says, "the president of the United States is the chairman of the board, the Congress is the board of directors, and we are simply laborers within the system. We are so keenly tied to world markets that any wiggle or jiggle from the United States sends tremors throughout the industry. Now, when the chairman of the board calls one of your primary customers the 'Evil Empire,' how can you do business?"

Farmers like Pat Wandling, Steve Nought, and Bill Schwerin don't like being subsidized, but they do want the federal government to enhance the position of American agriculture in world markets and the state government to invest in rural infrastructure and the research and development that will keep their products competitive. "The chief role that Olympia can play," explains Bill Schwerin, "is to enhance the state's economic viability. Agriculture as a whole is Washington's biggest industry; it's a tremendous machine, chomping at the bit. The state benefits when farmers succeed. If this state falters in its ability to produce, another will take its place."

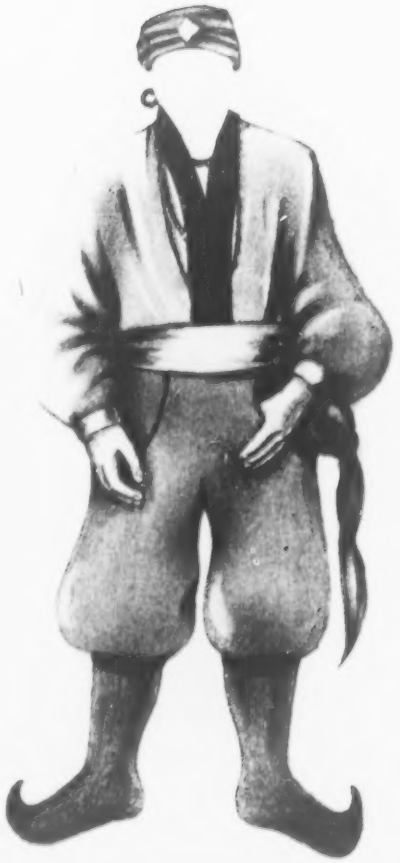
Why Be a Farmer?

Gregg Easterbrook, a contributing editor for *The Atlantic*, describes the farmer's condition: "Suppose that your year's salary could be $20,000 or $40,000 or $60,000, with the actual amount determined by a lottery based on what day you asked for your pay. That's the arrangement most farmers have to live with." If a farmer guesstimates wrong on when or how to sell his crop, he can lose thousands of dollars. In addition to their role as fortunetellers, family farmers have to be laborers, soil physicists, versatile handymen, biochemists, machinists, market analysts, and financial managers. And what's the payoff? Twenty thousand dollars?

For Pat Wandling, the reward is simply doing what he loves to do. In 40 years, he has only twice been off the farm for more than a week. There are just so many interesting things to do, he says, so many problems that challenge his inventiveness and resources.

Farming was not Steve Nought's first choice. After he graduated from college, he started a career with a large oil corporation as a junior executive. He traveled frequently, got a taste of the high life, and expected to make a lot of money. For him, though, the fundamental choice was not how to make a living, but how to make a life. When he was 29, he decided that the best life for him and his family was on the farm. Being a good businessman is important to him because it's the only way he can survive as a farmer and live the life he has chosen.

The way of life in rural America is clearly not what it used to be. Television, the automobile, and a mechanized farm have

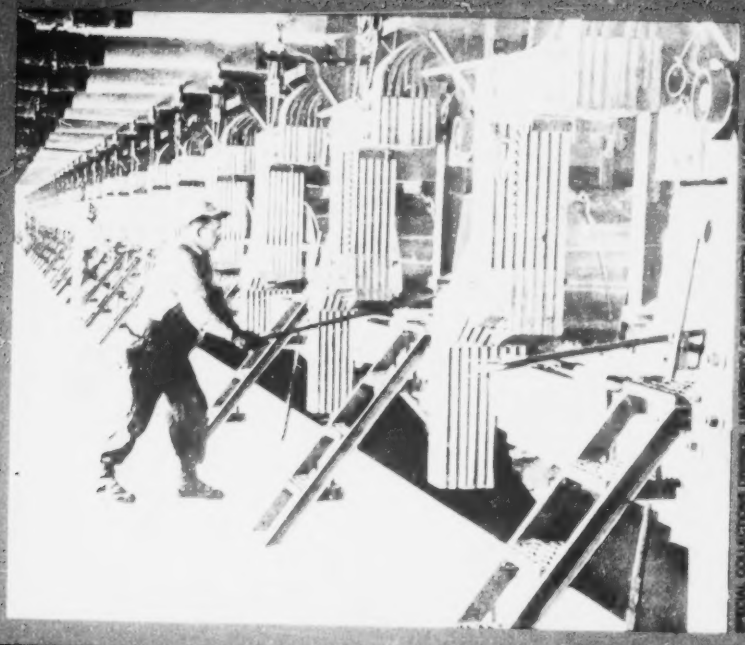


made families less dependent on one another. Still, because there are so few people in rural areas, every person seems to count more. In the Bickleton High School, where there are typically less than 10 teenagers in the graduating class, age segregation is unthought of. High school students are as comfortable talking with first graders as they are with nonagenarians. In the Odessa High School, 80 percent of the student body is in the band. "When you walk into the coffee shop in Bickleton," Steve Nought says, "it's like walking into family. Nobody sits off in a corner by himself." And nobody gets lost in the crowd.

"You can make a living on the farm," Nought confirms, "but if you want to drive a BMW and fly to New York for the opera, it's not the career for you. There are other things here you have to want more."

Jack Whelan is a lecturer in business communications at the University of Washington and a free-lance writer.

Gallery



Washington State, 1889-1989
The dream continues:
The rush of electric power
through an aluminum pot line.

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PACIFIC NORTHWEST Executive

A Regional Business Publication of the University of Washington Funded by Seafirst Bank

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Vol. 5, No. 3 July 1989

Employee Ownership and a Piece of the Capitalist Pie

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The Implications of Professional Credentials

Can There Be Rules for Office Romances?

Japanese Managers and American Employees

In Japan, the nail that sticks out is hammered down. In America, the squeaky wheel gets the grease. Why the difference? I have had reason to think seriously about this lately.

In 1986 I was part of the team that established the Panasonic subsidiary Kotobuki Electronic Industries in Vancouver, Washington. When we celebrated our first anniversary, I asked our American employees how they enjoyed working with us. For the most part they were happy, they said, but I was surprised by some of their criticisms:

- Japanese managers don't trust their American workers.
- The Japanese do not give their employees clear job descriptions.
- Japanese management is too slow in making decisions.
- Japanese managers criticize, but never praise.
- American managers are given many responsibilities, but little decision-making authority.

I hadn't realized until then that my American workers were experiencing culture shock, for the practices and attitudes that the Americans criticized are taken for granted by the Japanese. Culture shock in the work place can be a source of damaging misunderstandings and intolerable frustrations, and I knew that it would be a formidable challenge to communicate the reasons for our Japanese ways to our American employees.

Culture has two aspects—one objective, the other subjective. Foreigners easily recognize the etiquette, customs, trade practices, folklore, products, and behaviors of a culture. But few foreigners can understand the unfamiliar reasons behind the behavior of another culture's people.

Our American employees needed to better understand our way of thinking and our values. But I realized that I needed to better understand these things myself. One's culture is like the air we breathe—it's always there supporting our life, but rarely thought about. So this is my attempt to explain the values behind the Japanese management style.

Do Japanese managers mistrust Americans? Do they keep secrets from them? I don't think so. The problem lies more in the fact that the Japanese, according to terms defined by American practices, are simply poor communicators.

In Japanese culture, silence is golden, and the real messages are often communicated nonverbally. Japanese speak with great reserve, and their messages are often ambiguous. There is, for instance, a powerful etiquette that makes it difficult for Japanese to say "No" directly and clearly. Japanese instead value listeners who use their perceptiveness to understand the speaker's meaning. From a small bit of information that a speaker may convey—perhaps in a simple gesture or tone of voice—the Japanese listener gleans the whole meaning.

Americans understandably interpret this behavior as secretive, and they think the Japanese consciously withhold information. But perhaps Americans feel mistrusted because they don't have the authority that the same level of responsibilities or job title would give them in an American company. Again this has nothing to do with Japanese mistrust. Authority to make decisions is shared in Japanese companies in ways that Americans are not used to, and whether a manager is American or Japanese, the authority he is granted is more a function of time than of his job title. Authority is given as a reward for loyalty and a consistent demonstration of responsibility. Trust is earned, and it takes time to earn it.

Japanese managers are given the chance to prove their ability by being given responsibilities in several different departments over the course of 10 to 15 years. During this time, they work alongside many different people and develop extensive working relationships based on trust and respect. This is why job descriptions are not clear—a manager in a Japanese company is expected to be a generalist. At the end of this long process, a manager is granted a degree of authority, because he has proven himself trustworthy.

But even when a manager earns this trust, he is rarely given the kind of individual authority that is common in American companies. Americans value an aggressive, quick, individualistic decision-making style. But the Japanese favor consensus. Working relationships in Japanese companies are long term, and loyalty, cooperation, and harmonious interpersonal relationships are very important. Japan's participative management style means less individual authority and a much longer decision-making process. In this system, the nail that sticks out tends to get hammered down.

Maybe Americans who were used to standing out and who expected praise as a result were bewildered when no praise (or the hammer) came. But it is important for Americans to understand that Japanese rarely praise others, because they are uncomfortable when others praise them. Praise is confused with flattery, and flattery is a cause for mistrust.

Japanese children are raised in a way many Americans would find severe. They are continuously taught to conduct themselves properly to avoid shame and disgrace. They know that they are expected to do well, and they do not expect to be praised unless their work is truly outstanding. The Japanese are, perhaps, motivated more by a fear of shame than by the desire for praise, but there is also a profound desire to excel. For this reason, the Japanese always look for a better way to do something. Work can always be improved. This is the motive behind Japanese criticism.

So there is an understandable truth at the root of each of the American complaints. The Japanese do not communicate clearly. They do not give much individual authority. They make decisions slowly. They do not praise. But there are deeply ingrained cultural reasons for these behaviors—not an anti-American bias.

Now I would like an American to explain why the squeaky wheel gets the grease!

John A. Kageyama
America Kotobuki Electronics Industries

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Pacific Northwest Executive is a publication of the University of Washington made possible by a grant from Seafirst Bank.

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Pacific Northwest Executive is published four times a year in January, April, July, and October by the Graduate School of Business Administration, University of Washington. Permission is granted to quote, with credit.

Correspondence related to subscription or other business matters should be addressed to the Executive Editor, 336 Lewis Hall, DJ-10, University of Washington, Seattle, WA 98195, (206) 543-1819. We welcome requests for inclusion on our mailing list.

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PACIFIC NORTHWEST Executive

A Regional Business Publication of the University of Washington Funded by Seafirst Bank

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EMPLOYEE OWNED FIRMS:

ECONOMIC IDEALISM GIVES WAY TO POLITICAL REALITY

BY DANIEL JACK CHASAN

Early last year, millworkers in Omak, a northeastern Washington town of 4,800, heard rumors that Omak Wood Products, the town's largest employer, was going to change hands again. The workers were apprehensive, for the plant had gone through a succession of nonlocal owners since the 1960s, and every time it was sold, employees lost their jobs. When Crown Zellerbach bought the company in the early 1980s, it shut down the furniture factory, throwing hundreds of people out of work. When corporate raider Sir James Goldsmith took over Crown Zellerbach, the small-town forest products firm passed into foreign control. This time, millworkers feared that the plant might go to another foreign owner, who would simply shut it down. "We felt we couldn't survive another sale," says Lloyd Grooms, the plant's union business agent.

Grooms and some of the mill's workers started discussing an employee buyout. They weren't alone: Jim Keogh, a state of Washington Department of Community Development specialist who aids worker buyouts, and Ron Rodriguez, the executive director of the Okanogan County Council on Economic Development, were also playing with the possibility. Before any commitments were made, Rodriguez took the union's ideas to plant manager Doug Princehouse to get his reaction. "If you have existing good management," Rodriguez explains, "it's extremely critical that you find out whether those capable people want anything to do with an employee-owned company." Not only can management make or break a worker-owned firm—just as it can any other—it can also be crucial to prospective lenders. Princehouse replied that an employee buyout would be the best thing for the mill and the community. He would be willing, he said, to stake his career on it.

Keogh then invited Princehouse and Grooms to attend a Portland workshop on employee stock ownership plans. Grooms, convinced that worker ownership would be the best alternative for Omak Wood Products, called Keogh soon after the workshop to tell him the plant was actually up for sale.

In early June, Grooms, Keogh, Rodriguez, and the state labor council set up a meeting so that workers could discuss the pros and cons of employee ownership. The employees decided to try acquiring the plant. To hire a consultant to do a feasibility study, Rodriguez and Keogh got commitments of $10,000 in state money, union members contributed $5,000, and another $5,000 came from the community. "This is a depressed economy," Rodriguez said, "and raising that kind of money here is really squeezing blood from a turnip." But the town of Omak was involved from the start. The buyout committee included not only union leaders, but also a local stockbroker, a realtor, and an accountant.

"There was less skepticism from the investment bankers than I had expected," Keogh says. "The fact that the mill had been profitable made a real difference." The buyout committee chose the firm of Drexel Burnham Lambert to handle the deal.

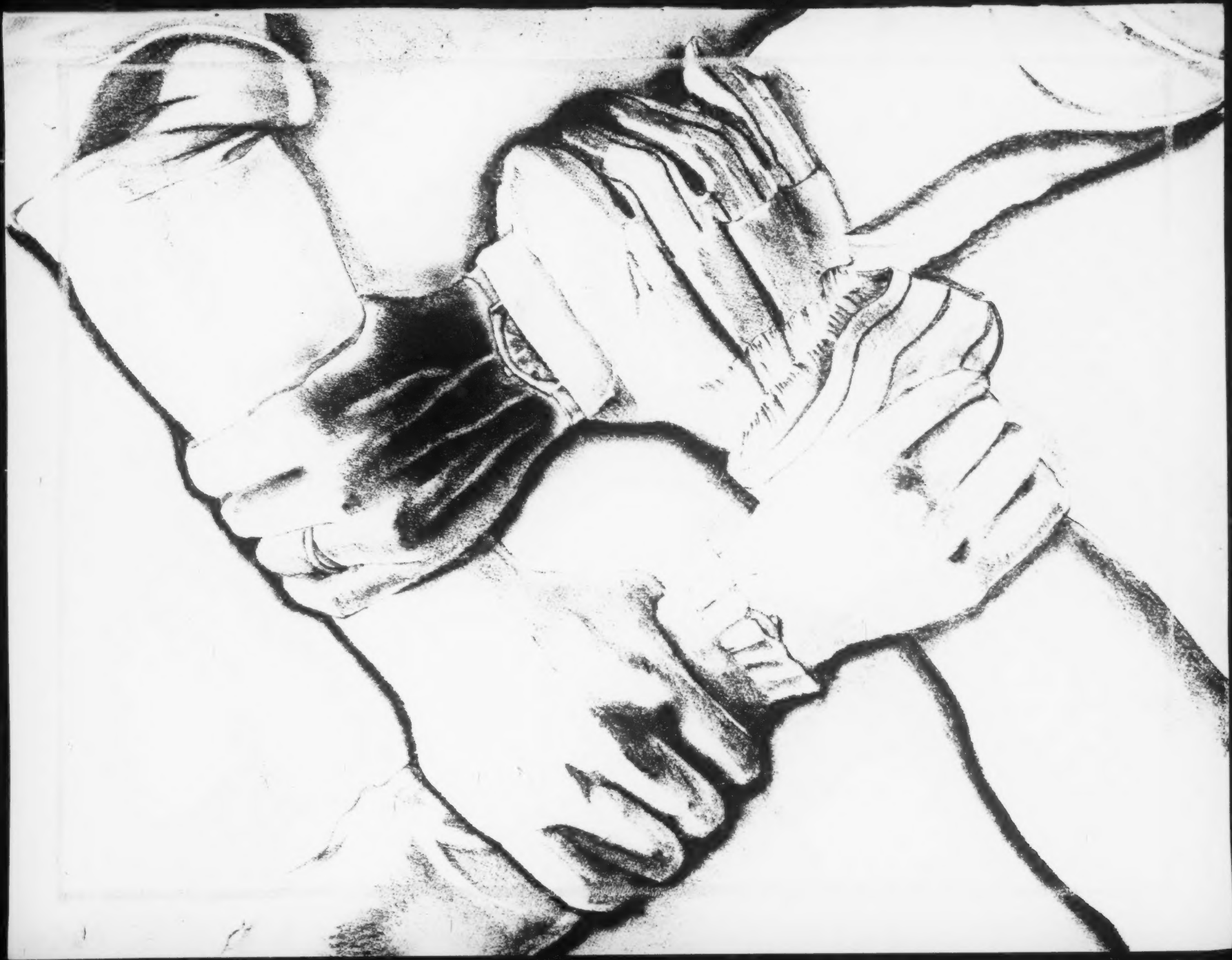
Everyone assumed that Goldsmith could and would sell the plant quickly, so, at a meeting in the basement of the union hall—amid galvanized tubs full of ice, beer, and pop—the pinstriped man from Drexel and the workers decided to submit a preemptive bid. Senators, the governor, and other political leaders lobbied Goldsmith to consider the bid. He did, and last fall, the employees bought the plant for $35 million. Goldsmith kept a 10 percent interest.

Princehouse became president of the employee-owned company, and the workers elected a board of directors. Now they have to make the company a success. Often, says Rich Feldman, an economic development specialist at the Seattle Workers' Center, "the focus is on putting deals together, but it's the post-deal process of getting employee participation and involvement" that will determine the success or failure of employee ownership. The people at Omak Wood Products, he maintains, have been very conscious of that.

Has employee ownership changed the atmosphere in the plant? "Absolutely!" Grooms says. The workers are "setting records all over." The stud mill has speeded up production by 16 percent. Maintenance and repair work have been rescheduled to weekends, when the machines are shut down. Absenteeism has succumbed to peer pressure, and more people are getting to work on time. (As owners, the millworkers are less willing to tolerate qualities in fellow workers that didn't bother them in the past.)

The worker-owners haven't paid off their debt, of course, much less proven that employee ownership will be a long-term success. Before buying the plant, they had decided—in what Rodriguez calls "an overwhelming response that fairly shook the walls"—to set aside 10 percent of their wages for up to six years to pay off the loan, if revenues from the plant weren't enough. To compensate for the workers' loss of take-home pay, many Omak merchants dropped their prices 10 percent. There had been tension between the millworkers and the merchants before, Grooms says, but "now we

LISA YOUNG



find we have more in common than we thought. The buyout has really brought the community together."

Omak Wood Products is now the largest firm in Washington State owned mainly by its workers, and it represents one of the largest worker buyouts of a nonfailing firm anywhere in the West. It's not the kind of worker buyout that generally gets the headlines. Press coverage tends to focus on the workers who, in a desperate effort to save their jobs, buy a firm that is on the brink of failure. The situation is dramatic, the prognosis is bleak.

Employee Stock Ownership Plans

The buyout of a failing firm represents only a few percent of employee acquisitions in this country. More often, workers start their own firms or buy out a sole proprietor who is about to retire. In Washington, Jim Keogh says, the owner on the verge of retirement represents a distinct minority of the cases, but nationally, it is the most common. In the not-too-distant future, the sole proprietor buyouts are likely to grow more significant—even in Washington—as the people who started companies after World War II retire. Normally, Rich Feldman explains, two-thirds of such companies just go out of business.

Ten million American workers have, through employee stock ownership plans (ESOPs), acquired at least partial ownership of nearly 10,000 companies. In most cases, the existing corporation sets up a trust to hold the employees' stock. The firm can contribute stock directly to the trust, contribute money to buy stock for the trust, or have the trust itself borrow money to buy stock. If the employees apply for a loan, the banks that lend the money get tax breaks on the interest, part of which they generally pass along in the form of lower interest rates. The corporation, then, gets an infusion of working capital at a bargain rate, and it can deduct payments of principle, as well as interest, from its federal taxes. In other cases, management can use an ESOP to finance a buyout or to put more shares of corporate stock into friendly hands in an effort to forestall a hostile takeover.

Regardless of how or why the ESOP is set up, the workers acquire at least part of their company—without having to contribute any money themselves. If the employees' stock has been bought with borrowed money, direct payments and stock dividends from the firm will retire the debt. As debt is retired, stock is deposited in the trust. Each employee's shares are kept in a personal account within the trust. When he or she leaves the company, the trust can buy the shares at their market value.

Although most ESOPs are established by healthy companies and worker acquisition of a failing firm is the exception rather than the rule, the worker buyout that has attracted the most attention in the Northwest has been Unimar, the company formed by unions trying to save the Marine Power and Equipment shipyard from closing permanently after its owner, WFI Industries, declared bankruptcy in 1986. The company's 400 workers now control three-quarters of the company. Don Liddle, the former president of the Inlandboatmen's Union, is the company's chief executive officer. Drexel Burnham Lambert, which put the buyout together, owns a minority share. The bankrupt WFI's major creditors have agreed to give the worker-owned company a chance, but the firm clearly faces a lot of problems. The shipbuilding and repair business in the Northwest has fallen on hard times, and employment in the yards that work on large vessels has plummeted. Nevertheless, the yard is open, the workers are working, and prospects are brighter than they were two years ago.

The Cooperative Experience

Worker ownership is nothing new in the Northwest; plywood mills have been cooperatively owned for decades. In the mid-1980s, when the recession and the consequent restructuring of the forest products industry began forcing some firms out of business, millworkers bought up some of the marginal plants. The industry's return to prosperity has placed a tremendous strain on many of the cooperatively owned mills. A few years ago, there were 16 plywood co-ops; only half have survived.

Outside critics say that one of the co-ops' main problems has been the appreciation in value of each worker's share. When a share becomes too valuable, it's virtually impossible for new workers to buy their way into the organization, so the mill must confront the tension of a two-tiered system in which some workers are owners and others are simply employees.

One successful plywood co-op's manager, who asked not to be identified, says that the mill's "major weakness is its lack of forward planning. There's a money-in-my-pocket-now attitude at the expense of the future." He grants that a co-op, unlike a conventional corporation, is oriented "more toward employment stability and income continuity than profit." But he still feels that there is "a tendency not to respond to economic changes quickly enough"—not to cut wages when times are bad or to invest in capital improvements when the market picks up. Because "the worker-owned affair is a political animal," he says, the board of directors is elected for political reasons, not for business acumen. Still, the drawbacks of cooperative ownership don't necessarily outweigh the advantages: "You can't knock the interest level and the pride," he says.

Ten million American workers have acquired at least partial ownership of nearly 10,000 companies.

Rich Feldman points out that the interest level and the pride are not automatic. Management must work hard, particularly in a large firm, to educate workers about the aspects of the business that they don't normally see. A good example, he suggests, is Western Cascade Truck, a two-year-old worker-owned truck repair shop in south Seattle. "Those people aren't just twisting wrenches," he says. "They're looking over financial statements."

Pat Mallara, one of Western Cascade Truck's founders, says that the pride of the worker-owners can be seen in their productivity and work quality. They know that the firm's success rests squarely on their efforts. The company was formed two years ago by the union mechanics of a large truck distributorship that was about to close its repair department. Mallara went to the Seattle Workers' Center and talked about cooperative ownership with Feldman. Each of the original 12 mechanics (one has since dropped out) contributed $2,500 to start and

another $2,500 after the first year. They haven't borrowed at all, although they are considering bank financing to support the undercapitalized company.

Setting up a firm that's entirely worker owned, Mallara says, "takes a very select group of people. You're living close together—like a family—and you're dealing with finances all the time." Western Cascade's new owners are dealing with such concerns for the first time. "They're used to going to work, being directed, working from 8 to 5," Mallara explains. Making the transition to managerial responsibilities isn't entirely natural, and not everyone has made it yet.

They've already learned some harsh lessons about the business world. They started out doing repair work for independent truckers they knew, assuming that these personal acquaintances would pay their bills. Some did, some didn't. "We lost about $22,000 in the first 18 months on uncollectables," Mallara says. Even the independents who paid faithfully tended not to pay promptly. Now, Western Cascade deals primarily with large companies.

Bob Markholt, the general manager of The Meat Shop, a cooperatively owned company that provides the fresh and cured meats for five Puget Consumers' Co-op stores and sells to Larry's Markets and QFC, knows that the problems of cooperative ownership should be put in perspective. Many cooperatives don't survive, Markholt agrees, but "I think our kind of business gets a particularly bad rap. Most businesses fail."

"It took us a good year to turn a dollar," says Mike Stone, business manager of the Port Townsend Shipwrights' Cooperative, which repairs and builds wooden fishing boats and yachts. Six years ago, when the shipwrights decided to form a co-op, they didn't have a Jim Keogh to give advice, so they just felt their way. To begin with, they didn't know what kind of a business structure they wanted. They got the by-laws of Port Townsend's cooperatively owned Salal Cafe, which in turn had borrowed them from a reforestation cooperative in Eugene, adapted them slightly, and went into business. Each of the original six members put in $125 and brought his own tools.

If the first challenge was getting organized, the next was dealing with success. The cash was accumulating, but the co-op had no way to distribute the profits. The shipwrights hired a Seattle bookkeeper, who suggested that they drop the cooperative structure and become a regular corporation. They sought other advice, at a cost of $4,000, and restructured the cooperative.

Now, each of the eight members (one of the original owners dropped out and three new people have come in) owns one voting share, which costs $1,000. Each is entitled to a share of the profits, to vacation pay, retirement money, and insurance—all of which are allotted according to how many hours the member works. Currently, 40 percent of the profits goes back into the business, and the other 60 percent is divided among the members.

The Port Townsend Shipwrights' Cooperative has prospered; the members who once worked outdoors, regardless of the weather, now have a boat shed, an office, and a shop worth $85,000. Although they were once idle during the summer months, when commercial fishermen, their only steady customers, were out fishing, they've advertised for yacht repair business and are now busy all year around.

"They didn't come here to be part of an alternative business. They came here because they wanted jobs."

The members don't exactly enjoy the twice-monthly evening business meetings at which all major decisions are made, but neither do they want to delegate the decision-making to anyone else. And if they weren't sure about wanting to form a cooperative at first, they're now a "hotbed of cooperative sentiment"; they have even lobbied the state legislature for assistance to co-ops.

Ideology and the Need for a Job

The stereotype of the workers' co-op as an artifact of the counterculture or of pre-World War II radicalism clearly doesn't apply to these cooperatives. "When people hear about employee ownership, they tend to think of radicals and all that crud," says the Seattle Workers' Center's Feldman. "It kind of contaminates the subject."

Actually, when Markholt, a former timber faller with a radical background, started the meat cooperative, he did think ideologically. It was a mistake. "One of the big blunders I made," he says, "was starting this co-op with a couple of guys who were Wobblies—they didn't know a thing about the meat industry. They're long gone." To Markholt's surprise, the other 13 co-op members basicaly don't care about philosophy. "They didn't come here to be part of an alternative business," he explains. "They came here because they wanted jobs."

The Meat Shop did $2 million worth of business last year. In return for investing $7,500—at the rate of $0.60 per hour—each full-time worker earned more than $20,000 last year, including profit sharing, which boosted each employee's income by $2 to $3 an hour. Markholt has little use for the old countercultural cooperatives in which "you basically had to take a vow of poverty. I've never believed that made any sense."

He hasn't abandoned his old radical ideals, but Markholt, who is on the Puget Sound Cooperative Federation board, says that "the successful management of a worker-owned company is not substantially different from the management of any other organization." The trouble is that "the people who start these businesses frequently don't know what they're getting into. I certainly count myself among them. I didn't know what a balance sheet was 10 years ago.

"Cooperatives," he adds, "are an irresistible idea. How else are you—as a worker—going to get some control over your future?"

Many people seem to find the idea, if not irresistible, at least very attractive. David Ellerman, a staff economist for the Industrial Cooperative Association, says that since the perceived collapse of socialism, there has been a lot of interest in employee ownership not only in Western Europe, but also in Eastern Europe, the Soviet Union, and China. In the past decade and a half, employee ownership in the United States has embraced 9 percent of the industrial work force—which approaches the diminishing 15 percent of the industrial work force that is unionized. "It's not a ground swell popular revolution," Ellerman points out. "ESOPs are tax breaks that go together with something else." Yet, when Polaroid and Procter and Gamble turn to ESOPs (albeit only to foil takeovers) and when Avis uses

employee ownership as a selling point in national television advertising, the concept has unmistakably entered the mainstream.

Corey Rosen, the executive director of the National Center for Employee Ownership, and Michael Quarrey, a former projects director, reported in the September-October 1987 *Harvard Business Review* that "ESOP companies have grown much faster than they would have without their ownership plans. We have found, moreover, that ESOP companies grow fastest when ownership is combined with a program for worker participation. . . . Regardless of company size . . . or the percentage of the company owned by the ESOP, the most salient correlation was between corporate performance and workers' perceptions of their managers' attitudes toward worker participation."

Virtually any employee ownership plan will inspire workers to a burst of productivity—at first. "There's always a honeymoon period of increased productivity," Ellerman says, but if workers aren't allowed to participate, that burst doesn't last.

Employee Control and the Access to Capitol

Ownership through an ESOP, even majority ownership, does not necessarily mean employee control. Management can appoint a trustee. Even if the employees vote for a board of directors, they won't necessarily have a direct say in the day-to-day operations of the company. When Lloyd Grooms attended that Portland workshop on ESOPs, he dismissed some of the proposed plans, because the companies involved weren't truly run by their workers.

Some people criticize employee stock ownership plans for their lack of real worker control. Louis Kelso, the San Francisco lawyer who created the first ESOP in 1956 and convinced Congress in the mid-1970s to make the formation of ESOPs easier and more attractive, says that the issue of worker control "is a teeny little question." The big question, he argues, is whether workers get a piece of the capitalist pie. Adam Smith and Karl Marx may have believed that labor was the great producer of goods and services, but the Industrial Revolution has since substituted capital for labor, and in the 1980s, it's misguided at best to pretend that wages are a pathway to economic success. Most people will never make it in this society unless their earnings from labor are supplemented by earnings from capital. Kelso believes that poverty is caused by the nonownership of capital. And on their own, most people will never acquire capital. In this day and age, Kelso says, a basic obligation of the state is to create institutions that enable people to acquire capital and pay for it with money generated by the capital itself. ESOPs enable them to do just that. An ESOP isn't about running a company; an ESOP is about access to capital.

Corporate America has found employee ownership easy to live with and Congress has found it easy to subsidize.

Employee-owners often aren't as concerned about the philosophy behind ESOPs as they are the possibility for immediate change in the work place. Steve Newman, a research associate for the United Steelworkers' Union, which has more experience with worker ownership than any other major American union, says "the universal lesson" that his union has learned about employee buyouts is that "the mere establishment of employee ownership does not cure all the ills that were there before." Often, he says, workers are disappointed to discover that it doesn't change much at all. To avoid that frustration, they must be educated so that they don't expect to "come in every morning and vote on what job they'll do." It is not unreasonable for them to insist that attitudes and relationships within the plant change, however, and Newman says that while people talk incessantly about changing attitudes, conversions are not always made. At a minimum, he says, labor and management "must work at establishing new rules of governance."

Although the steelworkers have gained extensive experience with employee ownership and other unions have been involved in buyouts, such as those at Omak Wood Products and Unimar, the fact is that the rise in employee ownership has created new questions for the labor movement. Ellerman calls the relationship between organized labor and employee ownership "a shotgun marriage."

He doesn't suggest that unions are superfluous in worker-owned companies or that the rise in employee ownership will render them obsolete. Since managers still "control the information, and implement the decisions," Newman says, they retain the balance of power within a company, and workers need someone to look after their interests. The steelworkers have actually gone out on strike against worker-owned firms.

Obviously, that is the exception; it's pointless for workers to bargain collectively with themselves. Ellerman says that while the union may become irrelevant as a collective bargaining agent, it will retain a crucial place "as the loyal opposition. It's hard to have a democracy with only one party."

There is no reason to believe that, as employee ownership spreads, the labor movement will wither away any faster than it is withering already. Corporate America has found employee ownership easy to live with and Congress has found it easy to subsidize in part because it does not require radical alterations in existing institutions. Employee ownership doesn't even create pressure for radical change. "Research has shown," Corey Rosen wrote in *The Journal of Business Strategy*, "that employees are conservative owners who almost always vote for existing management."

Conceptually, employee ownership is as American as apple pie. It dovetails perfectly with the idea that the American economy isn't really owned by a small clique of rich people on Wall Street, it's owned by millions of plain folks on Main Street. Stock ownership through employee pension funds has taken a significant step toward making that true. ESOPs and cooperatives can give workers an opportunity for economic gain, as well as old-age security, and allow them a greater sense of controlling their own fate.

It may be, as Louis Kelso argues, that the question of worker control is insignificant, but many people who have been involved in worker buyouts disagree. They see ownership as a step toward bringing democracy into workers' daily lives. "Democracy is supposed to be our number-one public value," David Ellerman says, "and yet we don't apply it to what people do all day long."

Daniel Jack Chasan is the author of The Water Link *and* The Fall of the House of WPPSS.

Economic Developments in the Pacific Northwest

For months, we've been commenting on the unprecedented, six-year-old expansion of the national economy and noting, in addition, that the regional economy still has room to grow. These past insights, while essentially correct, must now be modified by on-going changes in the character of the business cycle. The preliminary first-quarter gross national product report shows an extraordinary 5.5 percent real growth rate, with 2.4 percentage points due to an adjustment for last summer's drought. While the overall growth rate is indicative of an economy that is overheating, the economic picture becomes quite a bit cooler once the agricultural numbers are dropped out. Consumption, investment, net exports, and the government are all growing, but at sharply lower rates than in earlier quarters.

The national economic slowdown comes at a time when new Bureau of Labor Statistics data show that all three Pacific Northwest states were among the 10 fastest growing states in the nation in 1988 (Figure 1), a major change from our laggard pace earlier in the decade. And New England, whose government contracts and high-tech boom was the envy of the rest of the nation for much of the 1980s, has now calmed down considerably in terms of job creation. Boeing's continued megasales and slower but still noticeable employment growth explain much of Washington's outstanding performance, but the growth of many manufacturing sectors in Idaho and a variety of nonmanufacturing sectors in Oregon pushed these two states into the top 10 as well.

This regional economic strength may explain the relatively strong outlook offered by our forecast panel (Table 1). While the economists predict a slowing of real growth in 1990, they are not calling for a recession. Furthermore, the panel members see real increases in personal income in all three states and continued employment growth in 1989 and 1990.

As every beginning student of economics learns, the sudden shift of a supply or demand curve causes disequilibrium, and participants on both sides of the market must adjust. Western Oregon and Washington are now in the midst of such an adjustment, which was created by policy changes intiated by the biggest timber landowner in the region: the federal government (Table 2). Twenty-one percent of the 6.4 million board feet of timber harvested in Washington in 1987 came from national forests, as did 58 percent of the 8.2 million board feet harvested in Oregon. The U.S. Forest Service, the largest of the federal agencies, has been announcing new long-term forest management plans during the past year and is reducing the allowable annual cut in many of the local districts.

In comparison with the data from federal timberlands, the timber harvest on private and state lands has been essentially flat over time. The net effect of the federal government's policy changes, then, will be a total harvest reduction of at least 10 percent to 20 percent in the next two years.

To make matters worse, this decrease comes just as the leftover inventory of high-priced speculative contracts from the early 1980s is, at the insistence of the Forest Service, finally being worked off. Current harvest contract rates, therefore, are higher than the average of the recent past. The sudden move from extra-high harvesting levels to the anticipated low levels of the next decade will produce rather dramatic supply reductions in several national forests.

In some districts the reduction in the allowable annual cut is far greater than the average due to complicating factors such as habitat protection for the endangered spotted owl. On the Olympic Peninsula, the cut in 1990 may be only 40 percent of what was permitted in 1988. Small towns that are dependent on logging and timber processing will bear the brunt of the cutbacks and may be devastated by the changes. Aberdeen, Hoquiam, Forks, and Port Angeles in Washington and Estacada, Lebanon, and Sweet Home in Oregon are among the threatened communities. Most of these towns are already reeling from the continuing productivity improvements in forest products processing. Employment per unit of output has fallen by about 40 percent during the current business cycle due to increased mechanization in the mills. Adding log supply restrictions to the situation not only jeopardizes the livelihood of millworkers, it endangers the owners and employees of area retail and service firms.

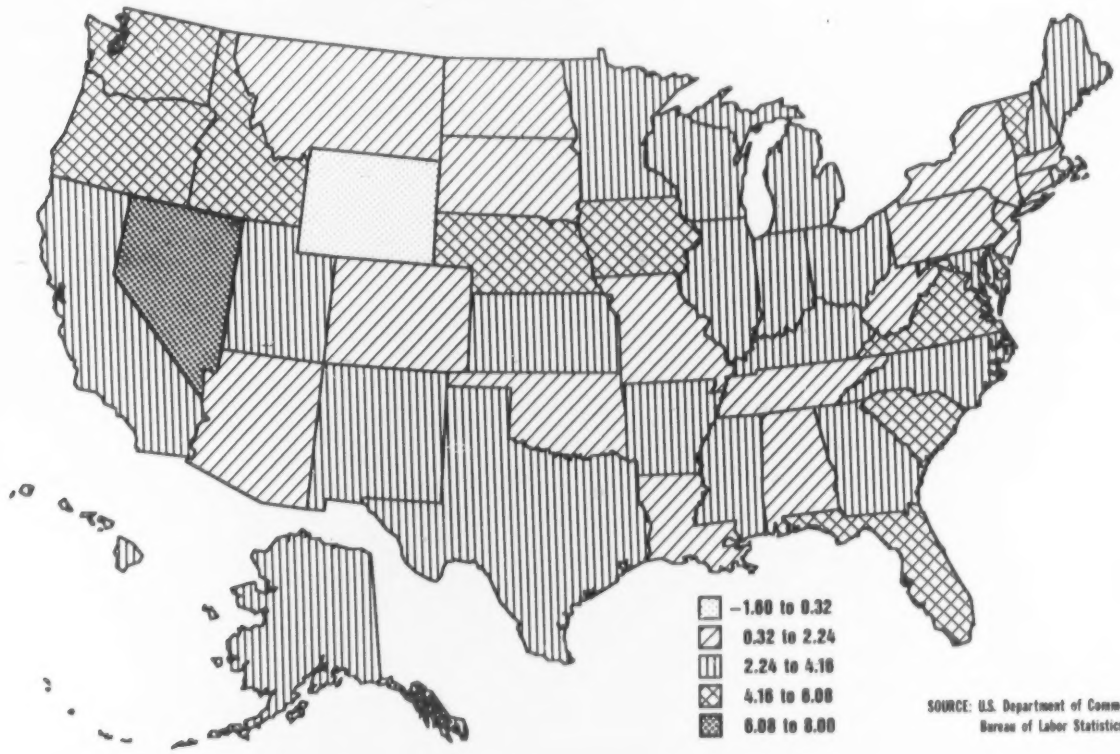
Table 1: Panel Forecasts
median annual percent changes

	REAL GROSS NATIONAL PRODUCT		IMPLICIT PRICE DEFLATOR
1988 actual	3.8		3.4
1989	2.6		4.9
1990	1.9		4.6
	NOMINAL PERSONAL INCOME	NON-AGRICULTURAL EMPLOYMENT	MANUFACTURING EMPLOYMENT
WASHINGTON			
1988 actual	9.0	4.6	6.3
1989	8.5	4.2	4.1
1990	7.0	3.2	2.0
OREGON			
1988 actual	8.8	4.7	3.9
1989	8.3	3.5	1.8
1990	6.5	2.0	0.6
IDAHO			
1988 actual	6.7*	4.6	7.4
1989	7.6	4.4	5.5
1990	6.7	3.9	4.8

*Preliminary estimate

Editor's Note: "Economic Developments" was prepared by Paul Sommers, research director of the Northwest Policy Center.

Figure 1: Percent Change in Nonagricultural Employment, January 1988 to January 1989



SOURCE: U.S. Department of Commerce, Bureau of Labor Statistics

These shifts on the supply side of the market come at a time when total wood fiber demand is at a very high level. Although the domestic housing market is cooling, that decrease has been offset by high log and lumber export levels, and a pulp and paper industry that is producing at full capacity. Absent a recession, the demand for stumpage will remain strong. While this situation is good news for public and private timberland owners, many mill owners, especially those with smaller independent operations, fear that they will be squeezed out of the market by high stumpage prices and sudden shifts in the availability of logs in particular districts.

A further complication is former President Reagan's suggestion in his last budget that the U.S. Forest Service be allowed to sell logs from federal lands to exporters. This is a practice that has been restricted (and in some specific cases banned) for the last 20 years. President Bush has repeated the export-sales suggestion in his revised budget submission to Congress.

Other timberland owners in the Pacific Northwest, as well as log buyers, have grown accustomed to the budgetary ban on federal log exports. With federal sales restricted to domestic buyers, the state of Washington and private landowners have profited nicely from the lucrative log export market; many independent mills, too, have enjoyed their quasi-protected status as processors of the logs from federal lands.

This stable equilibrium is now threatened by the possibility that the federal government will be free to sell to the highest bidder. With Japan's strong preference for the straight, clear grains of old-growth timber, which is mainly available on federal lands, much of the freed-up federal product would be likely to find its way onto ships bound for Asia—and in the form of logs, rather

Table 2: Timber Harvest by Ownership, Washington and Oregon, 1987

	WASHINGTON	OREGON
Private	61.5%	39.9%
State	16.5%	2.4%
U.S. Forest Service	19.2%	42.0%
Bureau of Indian Affairs	1.6%	1.4%
Bureau of Land Management and Other Public Agencies	0.1%	14.1%
Total Harvest (in millions of board feet)	6.4	8.2

SOURCE: Oregon State Economist

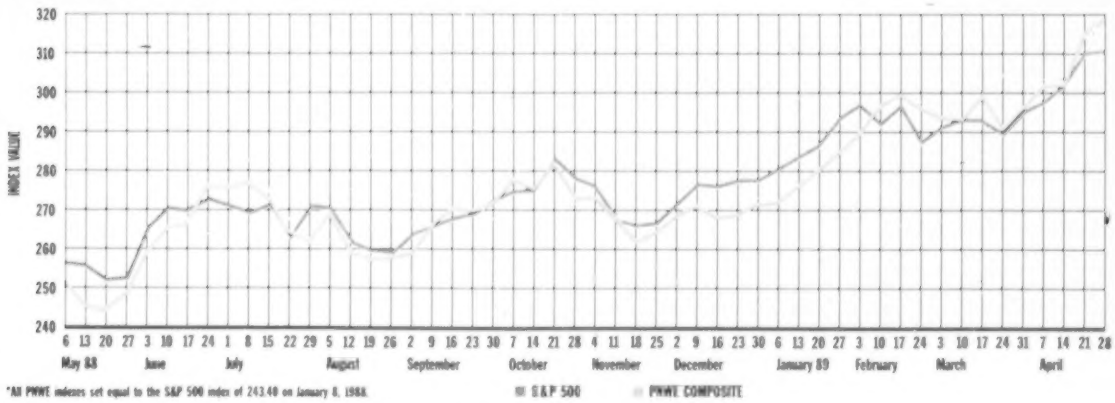
than finished lumber. Private landowners might see some reduction in the value of their stumpage due to a new, large competitor entering the export market. Mills set up to cut the old-growth logs from federal lands would face stiff competition for raw materials. A number of these mills could be forced to shut down because it is not economically feasible to convert them to process alternative species or sizes of logs.

While microeconomic theory might suggest that a new equilibrium in a freer marketplace would be Pareto-superior to the old equilibrium, this conclusion depends on where you draw the geographic boundaries of the analysis. If the Japanese receive all the efficiency gains, if U.S. businesses lose all the rents, and if no international compensation is provided by the "winners" to the "losers," U.S. workers, consumers, and voters are not likely to approve of this new equilibrium. If we restrict the analysis to the United States only, the increased federal exports and implied reduction in the federal deficit have to be weighed against lost business and personal incomes, unemployment claims, and welfare payments to residents in the affected areas of the Pacific Northwest. A careful cost-benefit analysis from the viewpoint of the country as a whole could swing either way. Viewed from the Pacific Northwest alone, the disrupted markets and threatened communities represent very large costs for the very marginal benefits of a lower federal deficit.

Politicians from the Pacific Northwest cannot afford to ignore the economic dislocations that these policy changes would cause within the region. In the middle of the current legislative session, Governor Gardner announced a four-point plan to guarantee some log supplies for in-state mills to offset federal reductions and to help the smaller mills regain competitiveness without directly challenging the right of would-be exporters to send out raw logs to Asia. Much of his program was enacted by the legislature. In Oregon, state agencies have been preparing alternative forest management plans for each of the national forests in the state in an attempt to convince the Forest Service to agree to higher harvest levels than are now being contemplated. Meanwhile, Congressional representatives from the affected districts have been working to reverse the federal administration's budget proposals. The outcome of these initiatives, given that the state legislatures and Congress are in session at the time of this writing, is impossible to predict.

The Pacific Northwest Executive Stock Index

S&P 500 and the PNWE Index, May 6, 1988—April 28, 1989*



*All PNWE indexes set equal to the S&P 500 index of 243.40 on January 8, 1988.

The Pacific Northwest 61: Firms Included in the Pacific Northwest Executive Stock Index

Manufacturing
The Boeing Co.
Bohemia, Inc.
Boise Cascade Corp.
Hecla Mining Co.
Longview Fibre Co.
Louisiana-Pacific Corp.
Morrison Knudsen Corp.
NIKE, Inc.
PACCAR Inc.
Penwest, Ltd.
Pope & Talbot, Inc.
Precision Castparts Corp.
TJ International
(formerly Trus Joist Corp.)
Univar Corp.
Weyerhaeuser Co.
Willamette Industries, Inc.
WTD Industries, Inc.

Technology
Aldus Corp.
Data I/O Corp.
Eldec Corp.
Electro Scientific Industries, Inc.
John Fluke Mfg. Co., Inc.
Floating Point Systems, Inc.
Flow International, Inc.
(formerly Flow Systems, Inc.)
Immunex Corp.
Intermec Corp.
Interpoint Corp.
(formerly Integrated Circuits Inc.)
ISC Systems Corp.
Key Tronic Corp.
Mentor Graphics Corp.
Microsoft Corp.
Tektronix, Inc.

Utilities
Cascade Natural Gas Corp.
Idaho Power Co.
Northwest Natural Gas Co.
PacifiCorp
Pacific Telecom, Inc.
Portland General Electric Co.
Puget Sound Power & Light Co.
Washington Energy Co.
Washington Water Power Co.

Retail
Albertson's, Inc.
Costco Wholesale Corp.
FabricLand Corp.
Fred Meyer, Inc.
Nordstrom, Inc.

Finance
Benj. Franklin Federal Savings & Loan Assoc.
West One Bank *(formerly Moor Financial Group, Inc.)*
Pacific First Financial Corp.
Puget Sound Bancorp
Safeco Corp.
University Savings Bank
U.S. Bancorp
Washington Federal Savings & Loan Assoc.
Washington Mutual Savings Bank

Other
Airborne Freight Corp.
Alaska Air Group, Inc.
Arctic Alaska Fisheries
Burlington Resources Inc.
Coeur D'Alene Mines Corp.
Expeditors International of Washington, Inc.

The Labor Shortages of the 1990s

by Laurie McCutcheon

One of the clearest expressions of the national economy's continued uninterrupted growth has been the falling unemployment rate. In February 1989 the jobless figure dropped to 5.1 percent, its lowest level since 1973. While the low unemployment rate has drawn the approval of many, it has also created a new problem within specific industrial sectors, occupational groups, and geographic areas in the Pacific Northwest. Simply stated, many businesses can no longer find enough suitable employees.

The February 7, 1989 issue of the *Wall Street Journal* announced that "labor shortages are getting tighter and tighter." The American Society for Personnel Administration found that 66 percent of the 700 personnel managers they surveyed in 1988 were having moderate to "very great" problems finding technical help. Federal Express, which employs 40,000 workers nationwide, recorded a 40 percent drop in job applications in the last several years. Among those who do apply, the company has noted, an increasing number are only marginally literate. Across the country, there are severe labor shortages in the health-care industry and in entry-level positions of all kinds. Within the Pacific Northwest, Bob Roberts, the director of the Renton Vocational-Technical Institute, describes the situation as "an acute labor shortage from Everett south to Olympia."

According to the Washington State Employment Security Department, the unemployment rate for the state dropped from 7.9 percent in December 1987 to 6.2 percent in December 1988. In that time, 45,500 net new jobs were added. The Boeing boom has stimulated much of this employment increase, but there has been a substantial level of growth and diversification in high-tech companies, electronics and machinery manufacturing, food and paper processing, and the service sector, which includes restaurants, health care, and business services. The shortages are acute in health-care workers, sales staff (such as cashiers), information processors (including general, medical, and legal secretaries), and skilled workers (major appliance repairers, electrical service technicians, and emergency service dispatchers). Boeing's decision to import 600 temporary Lockheed workers is an example of an extreme reaction to an inadequate number of skilled machinists.

While counties east of the Cascades are not experiencing the same level of economic growth, their unemployment rates have fallen since the early 1980s. Some skilled workers have migrated from the depressed areas of the state to the cities that line the I-5 corridor. Todd Shipyards, which went through Chapter 11 and layoffs several years ago, is now hiring qualified shipbuilders from the Tri-Cities and Bremerton. Dave Petersen, the director of the Pentad Private Industry Council in Wenatchee, confirms that about 10 percent of the council's trainees are placed outside the area, usually in the Puget Sound region.

Some of the growth along the I-5 corridor is now spilling over into other counties within Washington State. Boeing's decision to build a small Spokane-area plant, which will employ 350 people, was made in part because of the transportation congestion in King County. Seafirst Bank, citing lifestyle issues and the availability of labor and commercial space, plans to move its credit card operations to Spokane. Jack McGee, the executive director of the Applied Technology Training Center in Snohomish County, reports that many smaller firms are leaving the immediate area. Several electronics manufacturing companies, for example, are considering moving or have already moved to the Olympic Peninsula. The Morel Foundry in West Seattle, because of a shortage of suitable labor in the Puget Sound, is looking at Moses Lake or Ellensburg as a possible relocation site.

In a recent *Weekly Letter*, the Federal Reserve Bank of San Francisco revealed that increases in the cost of labor and real estate in San Francisco, Los Angeles, and western Washington are forcing firms to seek out slack labor markets. The result has been a rising growth rate in parts of the West—Idaho, Utah, central California, and eastern Washington—where labor is more plentiful. Areas with reserves of unemployed workers and lower living costs will become increasingly attractive sites for future expansion.

When the Economic Boom Fades

Will the labor shortages evaporate once the economy loses steam? Although the shortages will certainly become less severe, it is unlikely that businesses will be able to return to the easy years of the 1970s, when qualified and well-educated workers were ample and jobs were easy to fill. For some industries, the economic downturn of the future will bring little easing of the serious labor shortages they are now encountering.

Within the labor force, there are several underlying demographic trends that have occurred in conjunction with the nation's economic boom. The current shortages in the labor force are in part the result of a much slower rate of growth in the number of new workers. In addition, the people who will be seeking jobs from now until the year 2000 will have strikingly different characteristics than workers in the past. Moreover, the businesses that controlled labor expansion rates during the 1980s will be facing major replacement needs in the next decade. These companies now employ workers who are generally older than the average age of the working population. This is the situation, for example, within many utility companies, some of which will see 30 percent of their employees retire during the 1990s.

Remembering the Labor Surplus of the 1970s

In his office, an acquaintance of mine, who's nearly 40 years old, keeps a photograph of his first job—flipping hamburgers in a fast-food restaurant. Now in the personnel business, he often has young job seekers ask him if that photo is from his high school days. "No," he answers, "that was my first job after I graduated from college. That was all that was available."

During the 1970s, the national labor force grew 2.9 percent on average each year. It was the time when Baby Boomers were

entering the labor market, together with women of all ages. While the number of new workers grew by nearly 30 percent between the beginning and the end of the decade, the growth in jobs was insufficient to keep up with the flood of new applicants. Baseline unemployment levels in the 1970s were higher than those during the 1950s and 1960s, even during economic good times. It was much more difficult for Americans to find jobs, and it was not unusual to find Ph.D.s driving taxicabs.

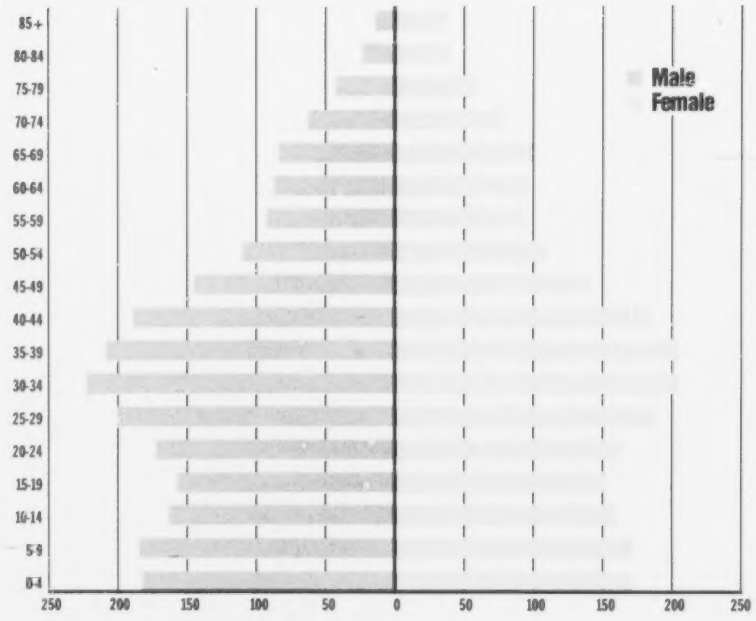
During this period of surplus labor, businesses didn't have to plan very far ahead in terms of employment needs. Peter Drucker, a management expert and professor of social sciences at Claremont Graduate School, recalled that strategic planning in the 1970s concentrated on anticipating markets for products and services, analyzing technologies, and forecasting those prospects relative to budgetary constraints. Although some business managers complained about high turnover rates and the cost of retraining personnel, turnover didn't present a substantial problem because labor was so plentiful.

The labor market was filled with individuals who were not only college-educated and well-trained, but also white and middle-class—"desirable" employees, according to the predominant cultural bias. For other segments of society, however, the impact of the labor surplus was devastating. It was during the 1970s, for example, that unemployment rates for young black males skyrocketed. In 1973 14 percent of 20- to 24-year-old black males were not working in the civilian labor force; by 1984 the rate had risen to 43 percent. Researchers Gordon Berlin and Andrew Sum have argued that the frustration experienced by young people—and blacks in particular—who tried to join the labor force in the 1970s has had an influence on the declining marriage rates, the striking rise in out-of-wedlock births, and the increase in the illegitimate drug trade and gang activity of the 1980s.

The Next Decade: Slower Growth

The owner of a service station not long ago complained to a Seattle *Post-Intelligencer* writer, "It's getting harder and harder to get 18-year-old workers. Five years ago, we'd put an ad in the paper and get 150 applicants. Today we have an ad in the paper all the time, and we still can't seem to find young people. It makes you wonder where they are."

Figure 1: The Projected Age Distribution of the Washington State Population, 1990
In thousands



SOURCE: Office of Financial Management, State of Washington

The fact is that many of those 18 year olds were never born. In a significant departure from the recent past, the labor force is growing much more slowly and will average only 1 percent annual growth in the 1990s. This trend is an inescapable consequence of the low birth rate years of the 1960s and 1970s —the Baby Bust years that followed the Baby Boom.

The effect of these fertility swings can be seen in the projected age distribution of the Washington State population for 1990 (Figure 1). The size of the 50- to 54-year-old segment of the population is about half that of the 30 to 34 year olds, who in turn are more numerous than the 10 to 14 year olds. By the end of this decade, the total population of 15 to 24 year olds will have declined by 15 percent; in King County, the drop will be closer to 20 percent. This is the effect of the Baby Bust generation moving into the labor force age range. During the 1990s, the number of 25 to 34 year olds will decline, as the Baby Bust generation ages another 10 years.

By the end of the 1990s, as those people born in the early 1980s come of age, the 15- to 19-year-old population will begin to increase again. But the state will continue to have a smaller young adult population than existed during the 1970s.

The labor force's slower growth means that workers who are now on the job, with their present skills and level of technological expertise, will comprise the vast majority of the labor force for the next 10 to 15 years. Given that understanding, the managers of businesses throughout the Pacific Northwest have good reason to be concerned about the need for work force retraining, about who will operate the complicated new technological production and manufacturing innovations of tomorrow, and how business will meet the needs of an aging work force.

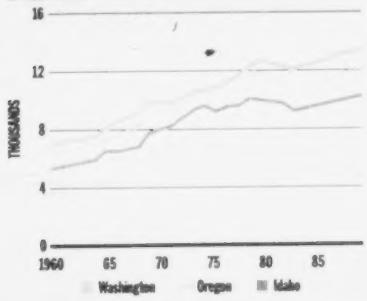
The Changing Face of the New Employee

Not only will the labor force be growing much more slowly, but the characteristics of people entering the job market in the next 10 to 15 years will be strikingly different from those of today's workers (Figure 2). According to the Hudson Institute's *Workforce 2000* report, commissioned by the U.S.

(continued on page 14)

Pacific Northwest Annual Economic Indicators

REAL PERSONAL INCOME PER CAPITA
In 1982 dollars



POPULATION[A, 1, 2]
In thousands

YEAR	WA	OR	ID
1960	2,853	1,769	667
1965	2,867	1,937	686
1970	3,413	2,092	713
1975	3,621	2,330	832
1980	4,132	2,633	944
1984	4,350	2,680	1,000
1985	4,407	2,689	1,005
1986	4,461	2,703	1,003
1987	4,542	2,723	1,000
1988	4,648	2,767	1,003

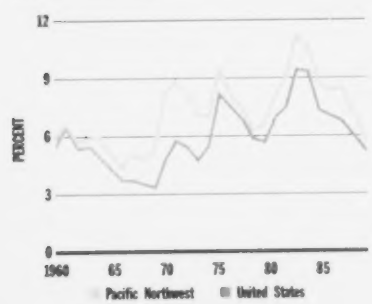
PERSONAL INCOME[B, 2]
In millions $

WA	OR	ID
6,914	4,819	1,263
9,094	5,497	1,736
14,234	8,369	2,486
23,258	14,072	4,548
44,562	26,063	8,128
58,416	32,302	10,357
62,832	33,955	10,863
66,470	35,778	11,184
70,992	38,182	11,859
76,538	41,068	12,644

FARM INCOME[B, 2]
In millions $

WA	OR	ID
261	180	155
287	185	237
361	235	277
943	431	416
1,007	582	512
1,189	583	521
1,025	627	490
1,387	777	552
1,508	920	717
1,392	909	698

UNEMPLOYMENT RATE



IMPLICIT[D] PRICE DEFLATOR
For personal consumption 1982 = 100

YEAR	US
1960	32.9
1965	35.6
1970	42.9
1975	59.2
1980	86.6
1984	103.1
1985	111.8
1986	114.3
1987	118.9
1988	124.5

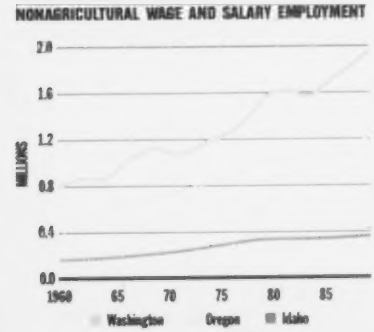
UNEMPLOYMENT[E, 2, 4] RATE
Percent of labor force

WA	OR	ID
6.3	4.9	6.0
5.4	4.5	4.8
9.1	7.1	5.8
9.5	10.6	7.3
7.9	8.3	7.9
9.5	9.4	7.1
8.1	8.8	7.9
8.2	8.5	8.7
7.6	6.2	8.0
6.2	5.8	5.9

TOTAL[E, 2, 4] EMPLOYMENT
In thousands

WA	OR	ID
1,020	682	264
1,107	776	287
1,281	803	281
1,412	929	342
1,828	1,189	395
1,857	1,209	429
1,921	1,202	429
2,018	1,245	432
2,005	1,301	435
2,153	1,326	447

NONAGRICULTURAL WAGE AND SALARY EMPLOYMENT



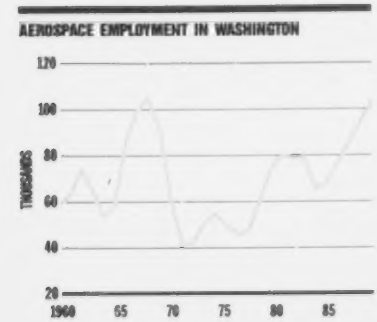
NONAGRICULTURAL[E, 2] WAGE AND SALARY EMPLOYMENT
In thousands

YEAR	WA	OR	ID
1960	812.6	509.2	155.2
1965	896.6	607.4	177.6
1970	1,080.0	709.2	209.3
1975	1,225.7	837.4	273.0
1980	1,608.3	1,044.6	330.0
1984	1,659.9	1,006.9	330.5
1985	1,710.4	1,030.0	335.9
1986	1,769.9	1,058.5	333.6
1987	1,851.8	1,100.1	333.5
1988	1,937.0	1,152.3	348.7

MANUFACTURING EMPLOYMENT[E, 2]
In thousands

WA	OR	ID
216.6	144.4	28.9
227.0	158.2	33.3
239.4	172.3	40.4
244.0	182.1	47.8
268.7	215.1	53.3
288.1	201.1	54.8
295.5	199.3	54.6
305.1	198.4	52.1
318.4	206.2	54.1
338.6	214.3	58.1

AEROSPACE EMPLOYMENT IN WASHINGTON



AEROSPACE[E, 2] EMPLOYMENT
In thousands

YEAR	WA
1960	57.8
1965	57.0
1970	61.5
1975	50.4
1980	79.6
1984	66.6
1985	76.0
1986	85.0
1987	92.9
1988	101.0

LUMBER AND[E, 2] WOOD PRODUCTS EMPLOYMENT
In thousands

WA	OR
44.4	71.9
46.9	74.2
42.2	66.8
47.2	69.6
47.0	69.5
41.3	66.7
38.3	63.6
38.4	64.6
40.0	68.0
41.4	68.7

PAPER[E, 2] EMPLOYMENT
In thousands

WA
18.0
19.8
19.8
16.4
17.6
16.2
16.7
16.7
16.6
17.0

CONSTRUCTION EMPLOYMENT[E, 2]
In thousands

WA	OR	ID
44.6	26.1	9.6
46.4	26.1	9.6
53.3	29.5	10.9
59.5	35.3	16.1
92.6	46.5	15.8
79.6	38.2	14.6
80.6	33.1	15.1
84.5	34.3	14.6
88.9	35.3	13.7
96.0	39.0	14.5

CONSTRUCTION CONTRACTS[C]
In millions $

YEAR	WA	OR	ID
1960	632.3	364.6	115.4
1965	1,006.7	585.7	186.8
1970	1,478.2	634.3	197.4
1975	2,819.3	1,035.9	398.6
1980	4,795.1	1,926.1	634.5
1984	3,748.1	1,744.7	617.6
1985	4,409.1	1,633.8	758.0
1986	5,054.6	1,603.8	679.9
1987	5,231.6	1,831.7	637.1
1988	4,945.7	2,164.3	846.3

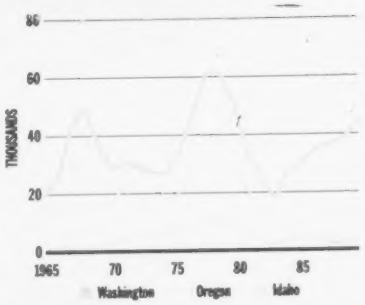
NEW HOUSING UNITS AUTHORIZED[A, 2]
In numbers of permits

WA	OR	ID
NA	NA	NA
20,131	15,610	1,846
28,262	16,980	3,565
35,209	20,091	8,172
33,375	19,480	5,795
30,367	8,060	4,193
35,474	11,297	4,307
36,434	10,662	3,804
38,341	12,218	3,185
44,348	14,069	3,296

AVERAGE LUMBER PRICE[D, 3]
1000 board ft.

PNW
$75.01
76.09
91.08
154.63
267.59
215.01
214.49
214.46
233.54
251.53

NEW HOUSING UNITS AUTHORIZED



PLYWOOD PRODUCTION[F, 2, 5]
In million board ft.

YEAR	WA & OR
1960	6,535
1965	9,720
1970	8,663
1975	7,722
1980	6,786
1984	8,319
1985	8,440
1986	9,545
1987	10,093
1988	9,436

LUMBER PRODUCTION[D, 2]
In million board ft.

WA	OR
3,377	7,402
3,648	7,580
3,189	6,680
3,104	6,342
3,161	5,784
3,697	7,202
3,419	7,211
4,132	8,149
4,645	8,846
4,275	8,115

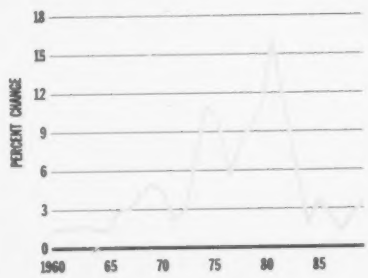
WOOD PULP PRODUCTION[A]
In thousand short tons

WA	OR
NA	NA
NA	NA
3,848	2,643
3,585	2,480
3,519	3,787
4,160	2,846
4,101	2,925
4,285	2,948
4,531	3,070
NA	NA

LOG EXPORTS[G]
In million board ft.

WA & OR
NA
901
2,216
2,225
2,632
2,722
3,004
2,780
3,168
3,682

CONSUMER PRICE INDEX
Seattle/Everett



ALUMINUM PRODUCTION[H, 6]
In thousand tons

YEAR	PNW
1960	527.3
1965	796.5
1970	1,390.0
1975	1,411.0
1980	1,574.4
1984	1,574.3
1985	1,356.4
1986	1,242.8
1987	1,382.7
1988	1,660.7

ELECTRICITY PRODUCTION[I, 7]
In megawatts

PNW
69,386
99,873
143,993
171,797
206,221
195,157
193,093
199,758
199,758
218,735

BPA ENERGY SALES[J]
In thousands of MWH

29,449
37,211
56,327
68,934
72,448
87,936
83,753
81,586
68,984
69,625

BPA AVERAGE PRICE OF POWER SALES[J, 8]
In mills per KWH

2.30
2.36
2.38
3.40
6.25
20.73
21.14
18.13
21.84
24.49

CONSUMER PRICE INDEX[K, 9]
1982 = 100

YEAR	PORTLAND	SEATTLE / EVERETT
1960	29.8	28.8
1965	32.3	31.9
1970	38.7	37.4
1975	53.5	51.1
1980	87.2	82.7
1984	107.8	103.0
1985	106.7	105.6
1986	108.7	106.7
1987	110.9	109.2
1988	114.7	112.8

FOREIGN TRADE[A, 10]
Portland and Seattle Customs Districts
In millions $

EXPORTS	IMPORTS
625	305
829	427
2,688	1,651
6,244	4,781
15,770	11,836
14,216	16,323
15,533	17,349
18,906	19,987
19,378	22,065
26,495	24,022

AVERAGE HOURLY EARNINGS[F]
For manufacturing production employees

WA	OR	ID
$2.63	$2.55	$2.25
2.98	2.94	2.65
4.06	3.82	3.29
5.82	5.53	4.77
9.41	8.65	7.55
11.61	10.44	9.34
11.63	10.50	9.41
11.77	10.57	9.66
12.01	10.56	9.70
11.95	10.64	9.93

SOURCES:
- A. Bureau of the Census, U.S. Dept. of Commerce
- B. Bureau of Economic Analysis, U.S. Dept. of Commerce
- C. F.W. Dodge Division, McGraw-Hill Information Systems Co.
- D. Western Wood Products Assoc.
- E. Washington State Employment Security Dept., State of Oregon Employment Div., State of Idaho Dept. of Employment
- F. American Plywood Assoc.
- G. U.S. Forest Service
- H. Direct Service Industries, Inc.
- I. Pacific Northwest Utilities Conference Comm.
- J. Bonneville Power Administration
- K. Bureau of Labor Statistics, U.S. Dept. of Labor

FOOTNOTES:
1. Includes armed forces residing in each state.
2. The 1988 figures are estimates.
3. FOB mill realization, coast region (Oregon and Washington) for Douglas fir and Hem-fir.
4. Data from 1978 to the present have been revised to incorporate a methodology change. See the July 1988 *Monthly Labor Review* for details.
5. Includes all types of structured panels.
6. Includes nine primary producers in Washington, Oregon, and Montana.
7. One Megawatt = 1,000 kilowatts.
8. One mill = 0.1 cents.
9. CPI for all urban consumers, annual average.
10. Data do not account for export of aircraft or shipments that pass through the Northwest and clear customs elsewhere. The 1960 figures do not include imports or exports by air.

(continued from page 11)

Department of Labor, the relatively small pool of new workers nationwide will include only 15 percent native-born white males, although they account for 47 percent of the current labor force. In the future, minorities will constitute 20 percent of the net new entrants, white women 42 percent, and immigrants 22 percent.

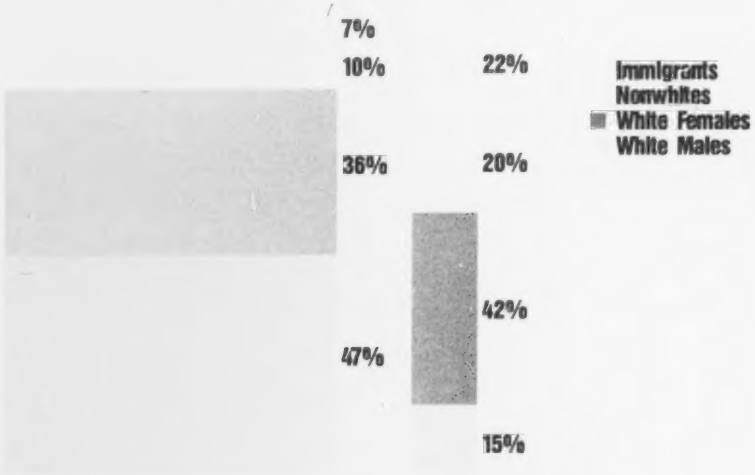
Washington State's total nonwhite population in 1980 was only 8.5 percent, which was distributed evenly among Asians, Native Americans, blacks, and other (primarily Hispanic) races, compared to 15 percent nationally. Nevertheless, the growth rate among minorities and immigrants between 1980 and 1987 has been far stronger than total population growth (Table 1).

Examples of this shift in population are already evident in some areas in the state. Of the Westin Hotel's 600 hourly workers in Seattle, approximately 25 percent are immigrants. According to Jack McGee, between 25 and 30 percent of the Applied Technology Training Center's student body are minorities and immigrants; the rest are primarily white women. There are very few white males. Manpower, the temporary agency, is under contract to find labor for Hasbro, a tenant of the Seattle Port Authority. More than half of the labor Manpower attracts is immigrant or minority.

In addition to the changing ethnic and racial character of new entrants, women will continue to join the labor force in increasing numbers. Since 1975 two out of every three new workers have been women. While single women have always been a strong element in the labor force, the role of married women and mothers in the job market has changed dramatically. In 1950 24 percent of all married women were working; by 1986 the figure was 55 percent. Between 1976 and 1987, the number of working women with infants increased from 30 to 50 percent. It should be noted that most of these mothers are in the work force for economic reasons.

In the face of a strong economy, an increasing number of jobs, and a shrinking supply of new labor, some businesses in Washington State—and around the country—have begun changing the employment practices that they established during the years of surplus labor. Some firms have become more flexible and innovative in hiring and managing their employees. Other businesses have yet to understand why finding qualified labor can be so difficult. Some attribute the problem to the lack of a work ethic on the part of the new generation of young people. All firms, regardless of their understanding of the changing job market, however, will have to adapt to the new environment of the 1990s.

Figure 2: Changes in the U.S. Labor Force



*Note: The number of new entrants into the labor force, from 1985 to 2000, are expected to equal only 28 percent of the current labor force.

SOURCE: *Workforce 2000*, Hudson Institute, 1988

Active Recruiting

Joe Casalini, an employment specialist at the Metrocenter YMCA in Seattle, recently commented, "Just a few years ago, restaurant owners would call up asking if there were young people available for work who looked reasonably presentable and had basic skills. Now they call up and ask, 'Do you have any warm bodies down there?' "

Employers are digging deeper into the ranks of the unemployed or the retired to fill their vacancies. And because advertising in the Sunday want ads, so effective in the past, today brings far fewer responses, employers have had to take more direct action to find employees. Outreach programs, particularly those sponsored by the large sophisticated organizations, are expanding. Job fairs, high school career-day events, college recruiting, and the use of public and private worker training programs are becoming much more common among employers. One nursing home, desperate for workers, offered a one-day job fair and general booster session directed at licensed nurses who are not currently working.

Some resourceful retail establishments and restaurants in the Northeast have started busing labor from inner cities to fast-growing suburban areas—and they pay workers for the transportation time. Universal Studios in Los Angeles trains and buses black and Hispanic youths to their summer tour-guide jobs. In Washington State, one fast-food restaurant on the east side of Lake Washington bought a commuter van and plans to recruit and transport employees from the south end of the lake.

Table 1: Population Growth by Race and Ethnic Status, 1980-1987

	Percent
Washington State	8.4
Whites	6.4
Native Americans	12.2
Blacks	16.6
Asians/Pacific Islanders	34.4
Others (Primarily Hispanics)	62.9

Smaller businesses, which generally have fewer resources and the greatest labor problems, are sometimes, Casalini said, missing opportunities for effective recruiting and retention. Even today, a fast-food restaurant may receive 20 calls each week from people looking for work. Employers, many of whom behave as if labor were plentiful, may not recognize that each initial contact is an opportunity to promote the business to the prospective employee or take the time to encourage the prospect. As a result, the job seeker drops out somewhere during the process or goes with a firm that is more sensitive to his or her interests.

One hospital spokesperson noted that personnel offices are becoming increasingly market oriented. "We can't just focus on client satisfaction," she stated. "We also have to think about employee satisfaction." A retail executive who was faced with the problem of substantial and costly turnover rates recently directed the company's human resource department to focus more on worker retention, and the once-high turnover rates dropped by more than 50 percent. "We used to be able to be autocratic managers and supervisors," he commented, "but that was in the days when labor was easily replaceable. You just can't be autocratic today."

Retention rates can be increased if managers and supervisors pay attention to the new employee's initial job experience, particularly his or her first two weeks. Although some business managers are so short-staffed that there is little time to deal with employee issues, they should realize that employees who are given a low priority have higher turnover rates, which in turn adds to worker shortages.

As people with different cultural and ethnic backgrounds enter the labor force, they bring with them diverse behaviors and practices that are different from those of traditional middle-class white management. The rapid rise in the number of women in the work place also means that working parents—men and women—are experiencing competing demands from children and aged parents. This increasingly diverse cultural mosaic has led some businesses to decide that the differences among employees should be ignored, that the intent of equal opportunity laws is to treat all employees the same.

A number of progressive companies, however, including Corning Glass Works, duPont, Digital Equipment, and Procter and Gamble, are beginning to highlight employee differences and are initiating or altering management classes to deal with changing work force issues. The *Wall Street Journal*, moreover, reports that Mobil, Avon Products, and Intel Corporation have set up ethnic advisory panels to examine white male biases in the work place. Other businesses have set up networking groups to explore worker issues, such as negative reactions to Hispanics who speak Spanish on the job or the stereotype that Asians are skilled technicians but not leaders.

Aetna Life and Casualty, another of the progressive firms, discovered that 21 percent of the women who resigned from technical positions did so for family-related reasons and that those women received higher supervisory ratings than the women who resigned for other considerations. Faced with the problem of continually having to find replacement workers, Aetna passed a new family leave policy designed to encourage retention. And it made a special effort to inform all supervisory personnel of their obligation to support the policy. Merck, a pharmaceutical company known for one of the most generous family benefit programs in the nation, found that significant numbers of its managers were circumventing the intent of the program. Because of this misuse of supervisory authority, Merck changed its management training programs.

By becoming more conscious of and sensitive to employee concerns, which continue to change as the work force changes, companies may be able to hold on to their employees longer, thereby reducing turnover rates and the costs associated with finding replacements. If managers realize that 80 percent of those people working today will still be on the job in the year 2000, they may place a higher priority on retaining good employees.

As time passes, it will become more difficult for businesses to meet the demands of changing technologies by hiring fresh graduates directly from school. To meet their labor needs, firms will have to retrain today's workers.

The Need for Training

As labor market conditions change, the need for employee training or retraining also changes. Given that the majority of the workers who will be on the job at the turn of the century are already in the labor force, corporate America can assume that the methods of work and manufacturing that involve new or emerging technologies will be carried out primarily by the current pool of workers. As time passes, it will become more difficult for businesses to meet the demands of changing technologies by hiring fresh graduates directly from school. To meet their labor needs, firms will have to retrain today's workers.

In addition, the number and breadth of training programs will increase as employers turn to high school dropouts, who total nearly 25 percent of the teen-age population, and other people who have poor educational and job skills to fill vacancies. With increasing numbers of immigrants in the work force, the institution of English language classes will become more widespread. The Renton Voc-Tech Institute, for example, began basic studies classes teaching literacy and computational skills nearly 20 years ago. Today the center offers 18 classes, and there is a long waiting list of potential students.

Seattle's Westin Hotel, aware that its nearly 150 hourly immigrant workers needed to improve their English-speaking skills, has joined with the Seattle-King County Private Industry Council and the Employment Opportunities Center to begin language classes. Westin pays its employees full wages for half of the time they spend in the classroom; employees volunteer the remaining hours.

Because of the Boeing boom, the electronics industry has been especially hard pressed to find qualified labor. Eldec, the Lynnwood-based maker of component parts for Boeing airplanes, is considering the in-

stitution of language classes to meet the requirements of its government defense contracts, which demand worker certification tests. According to John Vickland, the vice president of industrial relations, many of Eldec's immigrant workers have already had beginning English instruction, but they need more technical courses to be able to do the reading and writing necessary to pass certification tests.

A common thread in the comments of business and education leaders is that students have an easier time getting a job today, but they're harder to train. Private industry councils, a federal effort that replaced the CETA programs of the 1970s, work with the business community to train people for existing jobs, but the councils were originally designed to function in an environment of 8 percent unemployment. That unemployment level implies an ample number of well-qualified workers available for recruiting. With the current unemployment rate between 5 and 6 percent, however, recruitment and training is a much more difficult task. Many of the private industry council directors around the state have noticed an increasing lack of basic skills among trainees, and that deficiency requires more serious intervention efforts. According to Al Starr, the director of the Seattle-King County council, plans are now underway to redesign the training program to include more intensive instruction on topics such as good work habits and attitudes, as well as standard job skills. The next challenge for the organization, Starr said, may be to begin recruiting dislocated workers—older adults who have poor basic skills and are not yet willing to admit the need for retraining.

Wages and Benefits

The hard-to-fill jobs have had a direct impact on entry-level wages and benefit programs in the region's major cities. Because of labor shortages, the retail industry, other service sectors (including fast-food chains), and small manufacturers have found that the average wage rates for starting positions have increased. In 1988, for example, national wages and salaries in the retail sector grew by 5.2 percent, double the 1987 increase.

A recent entry-level worker study of firms in the Northwest, conducted by the Northwest Regional Educational Laboratory in Portland, concluded that those businesses that pay competitive wages and/or provide the best benefits plans are the most successful at filling positions and retaining employees. The companies that continue to offer low wages and minimal or no benefits are the ones feeling the severe shortages. Moreover, the study noted, many of the employers who are having the most difficulty finding new hires continue to maintain that the fault lies not with their ability to compete in a labor-scarce market, but with the labor force's declining work ethic.

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Along the I-5 corridor, firms are discovering that it's virtually impossible to attract and retain minimum-wage workers. Marie Kurose, an employment specialist with the Seattle-King County Private Industry Council, spent last year helping the new tenants of Seattle's Westlake Mall hire their staffs. She found that unless wages were well into the $4 per hour range there were very few takers. In the high-growth areas, entry-level jobs are paying double the minimum wage or more. According to a spokesperson for the private industry council in Snohomish County, where small manufacturing firms are growing in number and size, "Opportunity is just bursting at the seams. I tell employers who come to the council with jobs in the $4 to $4.50 range that maybe they can get someone with only minimal skills. A starting salary of $5 to $7 per hour is the norm here." A new Japanese firm that specializes in making floppy disks now starts entry-level workers at $7.60.

The job benefits that some employers are offering their new hires include vacation and sick days, health care insurance, and, in some cases, college scholarships, increased flexible time, and assistance in finding day-care facilities. Some hospitals with acute labor shortages have expanded their benefit plans to cover reimbursement for unused sick leave, the use of sick leave for children who are ill, and on-site daycare centers. (Daycare centers, however, because they are expensive and unsubsidized, are generally not available to the entry-level worker.) Some businesses have developed generous training and education benefits; electronics firms, for example, have quadrupled their education spending in recent years. Hotels, such as the Westin, offer employees complementary rooms and meals and supplementary bus passes. Manpower, the temporary-help firm, now offers one-week vacations to those people who stay with the agency a full year.

Until the Next Baby Boom

Sometime in the future, the economy's record growth will begin to abate. As the unemployment rate rises again, businesses will find more skilled workers available to fill their vacancies. The abundant labor reserves characteristic of the 1970s, however, are gone—at least until the next Baby Boom. The 1990s will be characterized by a labor force with an average growth rate only one-third the size of the 1970s figure. In addition to the slower growing labor force, the newest entrants to the job market will be women of all ages and minority and immigrant workers.

Those businesses that are now experiencing labor shortages or that anticipate expansion or increased personnel replacement needs during the next decade may find it useful to examine their current recruitment and retention practices. In an environment of labor scarcity, the firms that pay attention to effective job marketing, to support policies that reduce employee turnover, and to management training courses that strive to increase employee-employer communication and understanding, may successfully weather the labor supply storm.

Laurie McCutcheon is the president of a demographic research firm.

Poverty in the Pacific Northwest

by Robert D. Plotnick

The continued presence of poverty in a nation as wealthy as the United States creates serious moral and humanitarian problems. Poverty—and how we choose to deal with the problem—affects the social and economic health of the nation and the Pacific Northwest.

Poverty results, in part, from unemployment or underemployment. When people have so few skills that their earnings fail to provide a minimally decent standard of existence, they live in poverty. According to the U.S. Bureau of the Census, the official poverty lines in 1987 ranged from $5,447 for an elderly person living alone to $23,319 for a family of nine or more. The poverty level for a family of four was $11,612. If a family's cash income falls below the poverty line, all people in that household are counted as poor.

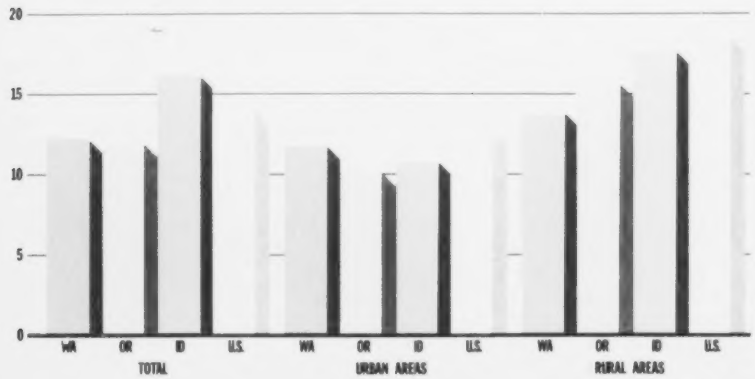
By failing to employ its entire work force, the economy can't produce at its full potential. The nation as a whole is poorer, and people have less of the goods and services they want. Poor children are less likely to develop into productive citizens, and, by ignoring them, we jeopardize a key resource, one on which our future growth and prosperity depends. And the inability of people to earn enough to support themselves and their families leads us to devote billions of U.S. tax dollars to a welfare system that nobody likes—not the taxpayers, not the politicians, and not the poor, who find it inadequate and personally degrading. An increase in economic self-reliance and independence would benefit the poor and the taxpayers.

To address the human and economic problems of poverty, the Northwest's policymakers and residents need up-to-date information on its extent. The U.S. Bureau of the Census, however, has not produced accurate data on poverty in the Northwest since 1979. In view of the economic changes that have swept through Washington, Oregon, and Idaho in the last 10 years, those figures are obsolete.

In the mid-1980s, the Northwest Area Foundation commissioned a study on rural and urban poverty in the Northwest, which developed new data on the topic in an attempt to improve the discussion of poverty and antipoverty policy in the Northwest. The study provides a record of each state's income maintenance policies and their contribution to reducing poverty, and offers suggestions of ways in which states can work to reduce the incidence of poverty.

The Northwest's recent economic changes have led some observers to call attention to the growing economic disparity between the urban sections of the region, especially the Puget Sound and Portland areas, and the small town and rural areas. This study, therefore, includes urban and rural poverty data to indicate the extent of the regional disparity.

Figure 1: Percent of the Population Living in Poverty in the Northwest and the United States, mid-1980s



The Extent of Poverty

The national poverty rate in the mid-1980s was 13.9 percent (Figure 1). Of the three Pacific Northwest states, Oregon had the lowest poverty level, with 11.8 percent of its population termed poor. Even though Oregon's per capita income falls below the national income average, its poverty problem is less severe than that of the United States as a whole. Washington's poverty level was slightly higher, 12.3 percent, but still less than the national average. Idaho, the poorest state in the region, had 16.1 percent of its residents living in poverty. Idaho's poverty rate is more than two percentage points above the national level. In all three states, the incidence of poverty was higher in the mid-1980s than it was in the mid- to late 1970s.

When the data are divided into metropolitan and nonmetropolitan place of residence, the poverty picture looks slightly different. Oregon has the lowest metropolitan rate, Washington the highest. Washington has the lowest nonmetropolitan level of poverty. In all three states, the percentage of nonmetropolitan poverty exceeds that of the metropolitan areas. Like other economic comparisons between urban and rural areas in the Pacific Northwest, the poverty data show that rural regions suffer economic disadvantages.

In the Northwest, there are 1,013,000 poor people; 398,000 live in rural areas and 615,000 live in the cities. In terms of numbers, Washington and Oregon have more urban poor than rural. The reverse is true in Idaho.

Income Support Programs and Their Impact on Poverty

Each state has a significant amount of discretion in setting the benefits and eligibility conditions for unemployment insurance

Table 1: Maximum Monthly Income Support Benefits, Compared with the National Median, 1988

	UNEMPLOYMENT INSURANCE	WORKER'S COMPENSATION	AFDC*	SSI**	MEDICAID
Washington	$760	$1,079	$640	$407	$152
Oregon	$844	$1,379	$595	$389	$137
Idaho	$716	$1,286	$494	$438	$163
U.S. Median	$756	$1,260	$524	$395	$157

*Combined cash and accompanying food stamp benefits for one parent with two children.
**Combined cash and accompanying food stamp benefits for an aged individual living independently.

Table 2: The Impact of State Income Support Benefits on Poverty

	NUMBER OF POOR BEFORE STATE BENEFITS	NUMBER OF POOR AFTER STATE BENEFITS	PERCENT REDUCTION
Washington	633,200 (14.4%)	540,100 (12.3%)	14.7
Oregon	376,900 (14.1%)	314,300 (11.8%)	16.6
Idaho	171,700 (17.5%)	158,500 (16.1%)	7.7

and worker's compensation—two major income support programs for which eligibility and benefits levels depend on past contributions, not on financial need. Within broad federal guidelines, the states also establish the eligibility and benefits levels for three major welfare programs: Aid to Families with Dependent Children (AFDC), Supplemental Security Income (SSI), and Medicaid. Welfare programs, unlike unemployment insurance and worker's compensation, base eligibility on a person's financial need. In addition, the three Pacific Northwest states have general assistance programs for needy individuals who are not covered by AFDC or SSI.

Benefits from Washington's unemployment insurance, Aid to Families with Dependent Children, and Supplemental Security Income programs generally exceed those of the national median (Table 1). The state's Medicaid and worker's compensation benefits fall below the median figure. Oregon's unemployment insurance, worker's compensation, and AFDC programs also exceed the national median; its Medicaid benefits are below it. Oregon's SSI benefits are but a few dollars beneath the median level. Idaho's worker's compensation, SSI, and Medicaid programs exceed the median; its AFDC and unemployment benefits fall under it.

In Washington, the combined AFDC and food stamp benefits available for a family with no other source of income totals 88 percent of the poverty line established by the Census Bureau. In 1987, for example, a family of four received state benefits to ensure a minimum income of $10,219, which is $1,393 below the poverty line. In Oregon, benefits equal only 84 percent; in Idaho, just 69 percent. The end result is that a needy single-parent family in which the adult is unable to find work or chooses to be a full-time parent faces poverty. Moreover, since 1972 the Aid to Families with Dependent Children and food stamp benefits, in real dollars, have fallen 19 percent in Washington, 18 percent in Oregon, and 37 percent in Idaho. These increasingly meager benefits are one important reason why the number of children living in poverty continues to grow. In contrast, the Northwest's needy elderly and disabled, who receive Supplemental Security Income and food stamp benefits, are able to maintain a standard of living above the poverty line.

To determine how well each state's income support system alleviates poverty, we measured the level of poverty that existed before state benefits were added to a family's income from private earnings and federal benefits, such as Social Security. The difference between this figure and the level of poverty once state benefits are counted reveals how much poverty was eliminated by the state transfer programs (Table 2). In Washington, 14.7 percent of the "pre-state benefit poor" were pulled out of poverty by its income support programs. Oregon did slightly better—16.6 percent of the state's poor were lifted above the poverty line. Both states are more successful at eliminating poverty than the country as a whole; the national average was 11.5 percent. Idaho's programs, in comparison, helped only 7.7 percent of its pre-state benefit poor escape poverty.

In all three Pacific Northwest states, transfer policies are less effective against rural poverty than urban poverty. In rural areas, Oregon's transfer payments take 15.9 percent of the people who would have been poor out of poverty, compared with an urban impact of 17.1 percent. In Washington, the corresponding rural and urban figures are 10.8 and 16.0 percent; in Idaho, 7.4 and 9.7 percent. (Why these differences occur, given that benefit programs are uniform within a state, is a topic that deserves further attention.)

The federal Family Support Act of 1988 stipulates that by the fall of 1990 all states must extend AFDC benefits to the needy two-parent families in which one adult is unemployed. This change will increase the antipoverty impact of income transfers in Idaho, which currently does not offer this form of support.

What Are the Options?

What to do about poverty—and how best to do it—raises highly contentious political and economic issues. To reduce poverty levels, states can employ two broad approaches: foster a healthy, growing economy and improve the income support system. Fostering economic growth, particularly in rural areas, poses difficult obstacles for all states. Policy-makers have no control over the national and international developments that can have a major effect on state and local economies. In general, the Northwest's congressional delegation should continue to support trade policies that foster exports and fight protectionist measures, which in turn sustain the Northwest's ports and its heavily export-oriented industries.

What states can do is provide an environment that supports the economic opportunities that evolve out of national and international economic change. This support includes upgrading the transportation and telecommunication infrastructure, improving the educational level, skills, and flexibility of the work force, and taking other steps to stimulate economic growth. Focusing such efforts toward rural and small town areas would help close the gap between

metropolitan and nonmetropolitan poverty.

One low-cost effort that offers potentially high returns would be for the state to provide rural community leaders with more extensive technical assistance about economic development strategies. The increased development of specialty crops and food-processing activities would build naturally on the existing rural economy, while offering the potential for greater value added and, consequently, higher incomes.

The alternatives for improving income support programs span a wide range. An interesting new proposal would allow the recipients of unemployment insurance or welfare to use their benefits to help start businesses. If such programs work, small towns and rural areas, which have a strong tradition of self-employment, may be more successful in producing new enterprises than cities. These new businesses should stress the development of products that can be sold outside the local area, thereby generating export earnings, which build the local economic base and create new jobs, or products that can substitute for imports, which would have the same beneficial multiplier effects. While using transfers to promote self-employment is hardly a complete solution for rural poverty, it is a possibility worth exploring.

Other options for improving income support programs are:

► **Raise Aid to Families with Dependent Children benefit levels.** None of the Northwest states has a combined AFDC and food stamp benefit level that exceeds 88 percent of the poverty line. Indexing welfare benefits to the inflation rate would also help ensure that the poor don't become poorer as the cost of living increases.

Such a policy would meet resistance on the basis of higher costs, but this option has two other complications as well. Higher AFDC benefits will not help those two-parent families in which there is a full- or part-time worker whose earnings are so low that the family remains poor, but whose employment disqualifies the family from the Aid to Families with Dependent Children-Unemployed Parent program. In addition, raising AFDC benefits will not reduce the poor's dependence on welfare payments; indeed, it will tend to increase the number of welfare families. Given the recipients' and the public's low regard for the welfare system, it would be more promising to explore ways to reduce the reliance on these benefits.

► **Implement "workfare."** Under workfare, the person who receives welfare understands that he or she is expected or, in some versions, required to look for and accept a job, or participate in education, training, or work experience activities in preparation for employment. In general, people who receive workfare begin to earn more money, and some leave the welfare rolls. But the changes are modest and have not had a major effect on poverty levels. So while the programs are good investments and help reduce poverty and welfare dependence, they are not a panacea for the poor.

Washington's version of workfare, the Family Independence Program, has begun operation on a small scale and will be extended gradually. If Oregon and Idaho do not have similar plans under development, they should begin the lengthy process of developing workfare programs appropriate to their economies and dependent populations, obtaining the necessary federal approvals, and implementing their programs. As they do so, these states should recognize that the appropriate job training, child care, and work opportunities for welfare recipients will differ depending on the local economic and social structure. Rural workfare programs will probably differ from urban ones. In any case, recent federal legislation mandates that all states must develop and implement workfare programs in the 1990s.

► **Improve the child support system.** Increasing the amount of support paid to mothers with dependent children would reduce their poverty and need for welfare payments. Northwest states may want to consider Wisconsin's new three-part approach. First, all absent parents contribute a percentage of their gross income, based on the number of children they are responsible for. This uniform percentage would be binding and standardized by law, so that absent parents with the same income and number of children would pay the same amount. These support payments would replace the child support awards that are now subject to adversarial judicial proceedings. Second, employers automatically deduct the payment from their employee's wages, just as they do for tax withholdings. The government then sends the money to the custodial parent. Third, if payments by the absent parent are too low to provide a minimum level of child support, the government makes up the difference between the minimum and that parent's contribution. This assured minimum would shield children from the full effects of an absent parent's low earnings or decline in earnings. A custodial parent who has a part-time job and receives the minimum benefit (or more if the absent parent's earnings are high enough) would often have sufficient income to move the family off welfare and out of poverty.

► **Improve outreach efforts to increase participation in income support programs.** The rate at which families participate in transfer programs tends to be lower in rural areas. Successful outreach efforts, which would give additional families the benefits to which they are entitled, could help bring rural poverty levels closer to urban ones.

► **Reform Washington's tax structure.** Washington State's reluctance to establish an income tax has created a tax system that relies heavily on sales tax revenues. This system taxes the poor more heavily (as a percent of income) than middle- and upper-income groups. Tax reform along the lines recently proposed by Governor Gardner would increase the after-tax purchasing power of low-income families and distribute the tax burden more equitably. In Oregon and Idaho, where income taxes raise a large portion of state revenues, tax reform would have lower priority on an antipoverty policy agenda.

Economic Prosperity Is Essential

A successful commitment to reducing poverty requires more than the formulation of new state policy initiatives. Economic prosperity is essential. Increased productivity and economic growth create more jobs and enhance wages, which help to reduce the number of people living in poverty. Moreover, the expansion of antipoverty spending is more likely during periods of economic prosperity. And expanded federal involvement will be necessary to provide the policy-making leadership and additional financial support for state efforts. Nonetheless, if Northwest leaders and residents take the problem seriously and commit more resources to fighting it, the social and economic costs of poverty can be reduced.

Robert D. Plotnick, an associate professor of public affairs and social work at the University of Washington, specializes in poverty, income support, and human resource issues.

Professionalizing Business Management: A Cautionary Note

by Thomas D. Morgan

"Professional Business Manager." The phrase has a ring to it. A certificate bearing that legend could certainly grace an executive's wall, and a business card with the PBM designation could be received with respect. No wonder some business managers aspire to achieve recognized status as professionals.

The goal is not surprising. The professional label has had an allure for literally hundreds of years. Originally, the term carried social standing. The professional was distinguished from a person who was merely "in trade." The latter was someone who corrupted himself by buying and selling goods and services; the professional didn't deal in such trifles. It's not hard to see which category the business person fell into. In contrast, the British barrister, that consummate professional, purported to accept only a voluntary contribution from each solicitor who brought him a case. (To get in to see the barrister, of course, the solicitor offered a gratuity large enough to be deemed acceptable by the barrister's nonprofessional clerk.)

The present desire for professional status, however, rests on more than history. Professional status now carries with it the sense of being the best in a given field. We speak of professional musicians or artists as a way of distinguishing those very few individuals from the rest of us. One key indicator of the professional's superior talent is that people are willing to pay her to do what she does. At most, we give our amateur athletes tuition, room, and board in exchange for their efforts; only the best athletes—the professionals—receive a truly generous reward for their work.

The demand for professional status is also encouraged by the traditional link between professional designation and advanced education. In the Middle Ages, practitioners of law, medicine, and theology were the best-educated—often the only educated—people in the land. The need for highly educated managers certainly applies to the present and future needs of business. The world is getting more complex, not less. Even the business manager in a specialized field will increasingly require the breadth of vision that can perhaps be best supplied by formal education.

Proponents of professional status for business managers also point to the cost of acquiring information about candidates for corporate positions. Resumes are only as accurate as the people who prepare them, and an applicant's references have no incentive to tell a potential employer the truth about the candidate's employment success.

Under such conditions, a reliable certification of the credentials of the potential business manager may seem both reasonable and desirable. Equal opportunity laws, for example, are based on the concern that qualified women and minority candidates not be overlooked when positions are being filled. If job applicants were to have a professional credential, busy personnel officials would be able to argue that the person they hired was certified capable of doing the job.

The Implications of Professional Status

For many years, professionals have been thought to hold a heightened sense of social responsibility. In his 1912 address to the graduating class at Brown University, Louis Brandeis, later a distinguished Supreme Court justice, listed three characteristics of a profession. First, he said, a profession requires necessary preliminary training that is intellectual in character, involving knowledge and to some extent learning, as distinguished from mere skill. It is, second, pursued largely for others and not merely for one's self. Finally, the amount of financial return is not the accepted measure of professional success.

"Is not each of these characteristics found today in business worthily pursued?" Brandeis asked. His question is as relevant today as it was in 1912. The answer is equally as obvious as the one Brandeis hoped his contemporaries would give. Business can be considered a profession and business people should be encouraged to be professional in the Brandeis sense.

Yet, professional status often carries with it implications that may be unforeseen by its proponents—implications that almost inevitably lead to change. I believe that the consequences of professionalizing business management would prove damaging both to business in general and to its newly professionalized managers.

The problem is not simply that some professionals flatter themselves and see their status as something to which others should defer. Those people only fool themselves. The problem is that professionalization, at least as traditionally experienced, tends to produce areas of exclusive practice within an increasingly interdependent world.

Sociologist Eliot Freidson has studied professions for many years. His definition of a profession, formulated for the American Bar Association Commission on Professionalism, identified four characteristics. First, its practice requires substantial intellectual training and the use of complex judgments. Second, since clients cannot adequately evaluate the quality of the service, they must trust those they consult. Third, the client's trust presup-

poses that the practitioner's self-interest is overbalanced by devotion to serving both the client's interest and the public good. And, fourth, the occupation is self-regulating—that is, organized in such a way that the public and the courts are assured that the profession's members are competent, do not violate their clients' trust, and transcend their own self-interest.

So stated, the definition seems attractive. In practice, however, the element of self-regulation presents particular problems. There is a clear tendency on the part of the self-regulators to place the interests of the producer-professionals ahead of the interests of their consumers. In business, those consumers are the professionals' employers. In a free market, where the consumers of services have alternatives, such a strategy will increase everyone's cost and frustration and ultimately be a disappointment to businesses and professionals alike.

Recognizing some business managers as professionals and denying others that status would restrict the capacities in which many people could be deployed. The professional label, once attained, is vigorously defended against those who haven't met the established criteria.

To take an example from my own profession, one of the most energetic units of bar associations in most states has been the unauthorized practice of law committee. Acting in the name of public protection, these committees work to stamp out the efforts of nonlawyers to provide services that lawyers themselves want to provide. The nonlawyers, of course, regularly offer lower prices, more convenience, more personalized service, and the like.

Professional business managers would have every incentive to act in the same way. There are a great many people in this country who would like to be business executives. Those with the professional label are almost certain, however, to argue that they are the only ones certified for and entitled to available positions. They will, like other professionals before them, seek a legal right to that entitlement, all in the name of "protecting" their employers against less qualified people.

Lest business people think that could never happen, consider the relatively innocuous case of certified public accountants. Designed to note a particular level of training and skill, the CPA has now become almost a minimum credential for conducting an audit of a corporation with listed securities. Very likely, the professional designation was first used to assure all parties that the audit was conducted in accordance with generally accepted accounting standards. My point, however, is that when those who earn a professional label are treated as though the designation has a significance independent of their ability to do the job before them, business will not be the better for professionalization.

Another danger of professionalizing business management is that those who can point to certified credentials will start to think in terms of excuses for poor performance instead of ways to perform better. Instead of trying to identify the characteristics within each person that would enable him or her to do the job, for example, a hiring office could simply say, "But we hired a professional—what more do you want?"

The credentialing process can never capture and assess all the qualities that the professional should have. Because an educational requirement is typically a key element in obtaining the professional label, for example, the process of becoming a professional ultimately depends on what can be taught and tested. In principle, this process should involve a significant element of apprenticeship or practical learning. The realities of modern universities, however, make that unlikely. Testing requirements, furthermore, make it difficult to place much emphasis on the personal factors—the ability to get along with others, for example—that are often essential in top managers.

"The professional quality of dedication to serving client interests is an attribute of individuals, not of occupations."

Finally, the drive to produce professionals is costly both in time and in money. The ranks of professional business managers will be filled by those with sufficient time and wealth to acquire professional credentials. Those of us in higher education have a stake in being able to tell prospective students that they will graduate with professional status. Students like the sound of those words, and the drive to expand the pool of professionals grows, in part, because we educators press for that growth. At the same time, the desire to justify the expenditures necessary to obtain professional credentials leads to pressure to limit the number of people who are granted them.

Who Merits Status?

Business people who focus on status rather than performance do themselves and their employers a disservice. American business now has a remarkably successful system for determining which of its managers truly merit professional status: the manager is put in a practical job setting and his or her performance is evaluated, usually in terms of its objective impact on the company's bottom line.

Managers who achieve standing in their companies by that process don't need the "professional" label. Those who demand a professional designation because they cannot otherwise get recognition probably don't deserve the recognition in the first place.

Professionalism of the sort Brandeis had in mind will, of course, always be appropriate to business. A sense of public service and the company's long-term interests are necessary and are often, if not always, rewarded. The creation of a class of professional business managers, however, might just produce more problems than it would solve. Law professor Ronald D. Rotunda said that "the professional quality of dedication to serving client interests—of rendering a service beyond self-interest or duty, of a spirit of public service—is an attribute of individuals, not of occupations. While an individual may strive to be professional, an occupation can only strive to be a cartel."

I believe that our nation's business schools should concentrate on producing tough-minded managers who have a personal sense of their participation in an organization, a community, a nation, and a world. Let performance show who the professionals are; labels and certificates are likely only to mislead.

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MANAGING LOVE AND ROMANCE

by Adam Woog

In *Much Ado About Nothing*, Shakespeare wrote that "Friendship is constant in all other things/Save in the office and affairs of love." The combination of office and romance is a topic of enduring interest: the unpredictable passions of love running through the relatively structured confines of a corporation.

Occasionally conflicts between office and romance hit the headlines, as in the case of Philip Agee and Mary Cunningham, the Bendix Corporation's top guns who were, according to the rumors, lovers. On an everyday basis, office romances are tucked discreetly away in the Sunday newspaper announcements of weddings between coworkers or are the subject of not-so-discreet coffee-room gossip. In pop culture, hit movies and TV shows reflect our infatuation with white-collar passion: Maddie and David on "Moonlighting," the entanglements in *Broadcast News* and *Working Girl*, almost everyone on "L.A. Law."

But the issue is more serious than simple gossip or pop-culture storytelling. A number of recent nonfiction books address the subject of intraoffice romance, among them *Corporate Romance* by Leslie Aldridge Westoff, *Family Ties, Corporate Bonds* by Paula Bernstein, and the best-selling *Love at Work* by Margaret Kent and Robert Feinschreiber. The first two are fairly serious-minded looks at office love affairs; *Corporate Romance*, in particular, offers sensible, no-nonsense advice for managers. *Love at Work*, in comparison, is a pop-psych book written for single women who are scouting for mates in the work place.

Despite the variety and intent, however, the presence of such works on bookstore shelves is an indication that the topic involves more than prime-time storytelling. Managers and executives, as well as the scouting singles, are looking for ways to deal with love and work.

Love in the Office

Once upon a time, an office romance signified one thing: a male boss, a female secretary, everything hush-hush. If the affair became public or awkward, she left and he stayed, because he was more valuable to the company. But as the number of women entering the work force increases, as their corporate stature moves toward equality with men, and as singles bars lose their primacy as a meeting ground, the rules for hiring, firing, and in-house conduct are changing. With them, the attitudes and practices of senior managers are also being reconsidered.

Generally speaking, corporate managers tend to ignore or downplay the impact of office romances—be they heterosexual or homosexual—and their own role in governing them. Romance, they say, becomes a problem—and a legitimate managerial concern—only if it poses a clear threat to the good of the work place.

"There are so many individual differences that it's hard to generalize," explains Harlan Park, the assistant vice president for personnel at Safeco. "But I'd say that the majority of intraoffice romances don't have a negative impact on work. Most people are pretty adult about this sort of thing, and they handle it professionally."

That's not necessarily so, claims a February 1988 report published by a research organization called the Bureau of National

IN THE WORK PLACE

Affairs, which emphasized the need to recognize intraoffice romance as an increasingly legitimate topic of concern. Companies, the report said, should reconsider possibly outmoded policies and guidelines. Managers, meanwhile, have a responsibility to reassess their attitudes and take on more active roles as counselors and mentors.

Consider, for example, a boss who promotes her lover ahead of more qualified employees, or a husband who has supervisory power over the friends and colleagues of his wife. What about the two executives who are competing for the same promotion—and who are also an item? Or once-married co-workers, now divorced, who are struggling to maintain a professional relationship despite their personal feelings? Such situations can raise very real questions about confidentiality and conflict of interest, about the way personal feelings affect productivity and office morale, and about the mechanics of power in a personal relationship versus power in a corporate structure.

In Japan, where much of a typical employee's life revolves around work and where the corporation often functions like a large, omnipotent family, it is common, even expected, for a manager to seek out suitable mates for his still-single employees. The manager, having found an "office lady" for his engineer, or vice versa, will generally also serve in the important ceremonial role of go-between during the subsequent courtship and wedding.

But American companies have traditionally been unwilling to interfere in the private lives of their employees, and off-duty romances are not considered anyone else's business. "What people do on their own time isn't something you want to stick your nose into," says *Seattle Times* managing editor Alex McLeod. "You have to be pretty circumspect about interjecting yourself into a situation like that." Harlan Park adds, "Managers just aren't inclined to step in and thwart Cupid."

Most managers, in fact, would just as soon not deal with Cupid at all. It's tough enough instilling in employees the idea that they're being treated fairly in terms of salary or vacations, without the extra attention, conflicts, and issues raised by romantic relationships. Dick Goodwin, the vice president for human resources at Airborne Express, says that "a relationship presents, from a business standpoint, a dilemma that most managers wish they didn't have to deal with. It's just an added element in the equation, something extra that has to be factored in when you're making decisions about people."

Happy Employees

If happy people are productive people, as most managers believe, it stands to reason that fostering intraoffice congeniality creates a positive and productive atmosphere. "Any right-thinking business person hopes to create a harmonious environment among employees," Goodwin states. "We all have to work for a living, and we all have to work with other people, so we might as well get along with each other."

In a congenial working atmosphere where friendliness is encouraged, it seems almost inevitable that one or two of those close working relationships might bud into something more. When a romance develops, perhaps the easiest and most natural office reaction is indulgence; people generally exhibit a benevolent tolerance of the situation. A manager would be hard-hearted indeed to wish a new romance ill.

"Anybody would want a certain amount of closeness between employees," says Goodwin. "You want your people to have close relationships. But is *real* close going to be even better?"

Most companies maintain that the answer is a qualified no. Yet transferring that feeling into a set of formal guidelines is impossible, and even when corporations do set up formal policies, they vary considerably in strictness. It used to be, for example, that if a couple who worked for the same company decided to marry, one of them—usually the woman—had to leave. But today it is increasingly rare to find a company that completely forbids husband and wife employees. In these relatively enlightened times, more common are guidelines that prevent nepotism—favoritism based on marriage or blood relationships—in order to minimize the potential for conflicts of interest in the work place.

Conflicts of Interest and Confidentiality

Undue advantage is almost always bad for the company and unfair to other employees. While such opportunism may benefit a couple in the short run, it eventually sours their relationships with other employees. Typically, nepotism guidelines try to eliminate undue advantage by prohibiting one member of a couple or family from having supervisory or salary-setting power over the other. Sometimes the restriction is expanded to prohibit a couple from working in the same department or reporting to the same supervisor. Should two people within a department decide to marry, they're normally given enough time for one of them to find a new position in another section of the firm. If the company is too small to have separate departments, however, or if the jobs involved are so specialized that transfers are out of the question, the answer may lie in juggling their responsibilities so that there is no conflict of interest.

According to a recent nationwide survey conducted by the American Society for Personnel Administration, 60 percent of American companies have nepotism policies, and companies in the Northwest are no exception. Safeco's informal guidelines prevent married couples or blood relatives from holding positions in which one has responsibility over the other. "It isn't specifically forbidden," says Park, "but we're very successful at avoiding it."

The *Seattle Times* scrupulously avoids any potential conflict of interest. "*Times* policy is very explicit when hiring, contracting, and so on," says managing editor McLeod, "to avoid giving anyone even a hint of supervisory power over a close personal friend, a marital partner, or a blood relation." This policy can be extended to outside connections as well. When the wife of *Times* executive editor Mike Fancher was offered a position as Mayor Charles Royer's spokesperson, for example, it was deemed an untenable conflict of interest, and Fancher was offered another position within the newspaper's structure. (In the end, Fancher's wife declined the civic offer, and he remained as executive editor.)

A spin-off issue related to conflict of interest is the question of confidentiality, which can be especially thorny if one half of the couple works for a competitor. "The question doesn't arise with every job," says Airborne's Goodwin, "but it tends to become more exaggerated when you get into management ranks. You think, 'Can I trust this person to look after the company's best interests? Do I have to be concerned about where this person's loyalties might lie?' "

Barry Follman, the senior vice president and Puget Sound regional manager for U.S. Bank of Washington, says that when employees have spouses who work for competitive organizations, a certain amount of inherent trust is necessary. "When we bring people in," he explains, "we make it clear that whatever information comes into our bank stays here. Confidentiality is one of the primary services of a bank, and we don't want information about customers getting out. I suppose things do get said behind closed doors, but the rule remains that you simply don't breach that trust."

Nepotism guidelines, generally speaking, are adequate to cover situations involving married couples or family relationships. In these cases, the parties involved are usually aware of the situation from the beginning; the manager who hires a husband and wife will tell them up front about the rules and will be able to place them so that conflicts can be avoided.

No Rules for Romance

But a less tangible romance—two office mates who begin dating or living together, but whose union is not necessarily permanent—is considerably less well defined and consequently more difficult to deal with. Managers are more hesitant to interfere with a romance if there are no clear guidelines. The tendency is to act only after a problem has developed.

One very real situation is the drop in performance that can occur. In *Corporate Romance*, Westoff cites a Pennsylvania company president who was faced with a situation in which two managers (each married to another) fell in love, broke up with their spouses, and moved in together. The man's productivity dropped by 50 percent. The president, after considering his options, chose to place a newly hired assistant manager beneath him. After a time, the man's productivity rebounded, surpassing previous levels, in part out of gratitude for the president's support.

If an affair adversely affects other employees, by offending their moral sensibilities, for instance, or by providing fodder for intradepartmental gossip, the performance of the entire office can plummet. An especially scandalous relationship, such as a married employee having an affair, can have even more serious repercussions, affecting not only the climate of the office, but the company's reputation within the community or the industry.

Having a couple within the same working group can also compromise employer-employee relationships and create situations in which the manager, who's trying to run an office efficiently, is suddenly faced with the inevitable conflicting emotions that arise when close personal relationships exist. What are the possible repercussions, for ex-

ample, if a manager gives constraints or directives to one half of a couple, but not the other? If one does something outstanding and receives recognition, but not the other? Or if one needs to make frequent business trips? "Suppose you work for me," says Airborne's Goodwin, "and I say, 'Hey, I want you to get on a plane tonight and go to Boston for a week.' It's a business necessity. But if your girlfriend or wife works for me in another department, and she doesn't like the fact that I've sent you to Boston, I've run the risk of getting pressure from her. Those situations can get very awkward."

The Manager's Role

If a manager suspects that a budding romance is becoming a problem, the first step, as with any managerial problem, is to become thoroughly acquainted with the situation. "At whatever point you become aware of a potentially damaging relationship," Alex McLeod says, "you need to find out exactly what's going on." He stresses that knowing employees well is an essential tool for remaining even-handed. "I know my staff pretty well, but even so I'm sure there are relationships out there that I'm not aware of. Still, the manager definitely wants to avoid the appearance of condoning a problem situation."

After getting a clear idea of the circumstances, a manager must decide if the relationship is creating a negative impact. If so, the next step is to sit down and discuss the romance with the people involved. This means calling into play a variety of people skills; the manager must know when and how to intervene. "More and more managers are becoming counselors," says U.S. Bank's Follman, "although we sometimes step in too soon."

If it does become necessary to talk things over, managers have a responsibility to explain the situation clearly and compassionately and then work with the employees toward a solution. "If a romance is affecting the work place," Barry Follman explains, "you need to sit the people down and say, 'Look, you're both nice people, but this can't go on.' Sometimes people lose track of what they're really doing. They have to realize that their romance can be very disruptive to others in the office."

Discussion and compromise, McLeod says, can usually resolve conflicts to everyone's satisfaction. "You let the people know that some choices have to be made, and you try to put the choice in the hands of the people involved. It's then up to the individuals. Potential liabilities occur when there's an issue of fairness, so you want to make sure everybody knows that they're playing on the same field, with the same rules. You have to deal with people in a straightforward way, and you have to extend a certain amount of trust."

Sometimes, however, situations don't lend themselves to sober, adult discussions. The supervisor of a customer service department in a large regional organization recalls a couple who worked in the same department, started dating, became increasingly enamored of each other, and found it hard to keep their hands to themselves during business hours.

Their own productivity plummeted as they spent more time together, and office efficiency dropped as the gossip level rose. After warning them several times, in vain, the supervisor was forced to move their desks apart, so that the two were on opposite sides of the room, each out of the other's line of vision. "It didn't work," the supervisor says. "All it did, really, was drive them into the hallway. I felt exactly as though we were back in high school." Eventually, the couple transferred to separate sections within another branch.

A positive and upbeat romance is one thing, a relationship in dissolution is quite another. While there are examples of working couples who maintain a successful professional relationship, even when undergoing rough personal times, not all broken relationships are as successful. The aftermath of a failed office romance is not only painful for the couple, it can be unbearable for their colleages.

For the manager, the problems of an office romance gone sour can adversely affect every aspect of the work situation. When a relationship breaks up, raw emotions surface; ex-lovers can become depressed or fiercely adversarial. Friends and colleagues are often forced to take sides. Almost invariably, the couple's negative feelings spill over and influence others. "It's a tough situation," Dick Goodwin says, "and no good comes of it."

Most offices romances, of course, are benign, and, with intelligent and sensitive handling, the problems will be minimal. The issue is one that must be handled on a case-by-case basis, balancing compassion and concern for the employee with the best interests of the company.

"People are people," says U.S. Bank's Follman. "And you just have to be sensitive to their situations. We hire people because they're good, and we invest money in training them. We want to keep our employees and make sure they're happy and doing well. At the same time, we have a responsibility to the company. Those things just have be balanced."

Formal guidelines, used in conjunction with the appropriate labor relations and human resource departments, will clarify particular cases involving conflict of interest, but guidelines can't ever cover affairs of the heart. In the end, the successful management of romance in the work place depends on a manager's ability to anticipate problems and relate to people. "It's a management responsibility that has to be based in day-to-day reality," says McLeod, "rather than hard and fast rules. If you can manage in such a way that there is no influence or conflict—even if the potential is there—that's good management."

Adam Woog writes for magazines and newspapers in the United States and Far East.

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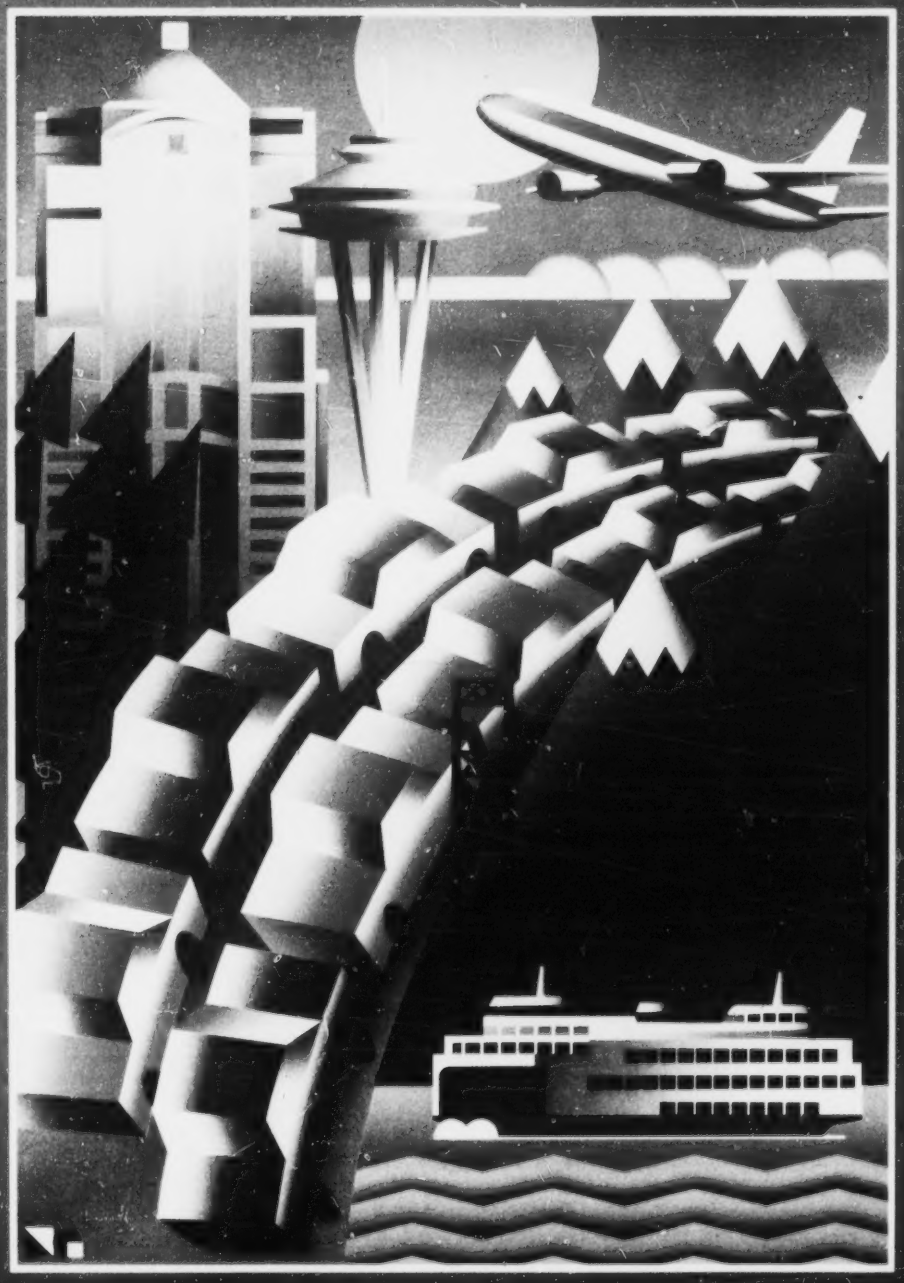
PACIFIC NORTHWEST Executive

A Regional Business Publication of the University of Washington Funded by Seattle Bank

University of Washington
Graduate School of Business
Vol. 5, No. 4 October 1989



Transportation: The Problems and the Politics

REGIONWATCH
- The Second Puget Sound Business Conditions Survey
- The Economics of the Commercial Landfill
- Agricultural Production Indicators

The Demand for Northwest Wood in Japan

Commentary

The Need for a Transportation Package

We take our transportation system, like a new car, for granted—until it stops functioning in the manner we expect and then we get frustrated and angry.

One of the government's responsibilities is to construct and maintain a viable transportation system. Our safety, our quality of life, and the economic vitality of our state depend on it. The viability of Washington's transportation system, however, is in question. Lengthy commuter traffic jams on freeways and major urban arterial roads have become the rule rather than the exception throughout the central Puget Sound region, and the situation seems likely to get worse before it gets better.

Seattle now bears the onerous distinction of having the sixth most congested highways in the nation, a standing that threatens our long-range economic vitality—not to mention every commuter's sanity. And traffic problems are just as bad, if not worse, in many other areas along the I-5 corridor. Gridlock has led some communities to enact moratoriums on new construction, and other towns are considering similar measures. News sources report that some Puget Sound businesses are contemplating a move to less congested parts of the country because of the nightmarish problems their workers have getting to and from their jobs. And some out-of-state firms, seeing the congestion, reportedly are rethinking their plans to locate here.

In addition to the traffic, another serious problem is simply maintaining our existing streets and highways. An exhaustive five-year study of Washington's roadways and bridges recently revealed that our state, county, and city governments will have a combined revenue shortfall of more than $15 billion in the next decade just to get the existing system up to minimum standards and maintain that level until 2000. And that shortfall does not take into account new growth and new traffic demands.

The main reason for this huge deficit is that Washington relies heavily on the gas tax—it provides about 85 percent of our roadway funding. Oregon, whose gas tax next year will equal Washington's at 18 cents per gallon, derives only about half of its transportation funding from that revenue source. Most states use multiple sources—such as income taxes, sales taxes, property taxes, higher local taxes, as well as gas taxes—to subsidize their transportation systems.

Gas tax revenue doesn't keep up with population growth, either, or inflation or the increasing number of vehicles on our roads. Today's cars get better gas mileage. Consequently, gas tax revenues don't increase, even though people are driving more.

The solution to our transportation problems, which will be far from painless, must involve several long-range changes. We must look at new ways to finance our transportation system. We must make a comprehensive effort to upgrade and expand all facets of transportation. No single mode of transportation can meet the growing demands and varied needs of moving people and goods throughout our state. We must encourage all governmental jurisdictions to work together on transportation planning, and that planning must be closely related to policies that address growth management, economic development, and environmental concerns.

Earlier this year, the Washington legislature attempted to craft a major transportation package to address these issues. Unfortunately, political fueding waylaid the package's key components, which were to:

► Establish the foundation for local and regional mass transit systems, increase special bus and carpool lanes on congested metropolitan freeways, and preserve the state's shrinking freight rail system. We need road improvements to prevent gridlock, yes, but we also need to focus on moving people, not just automobiles.

► Devise methods to finance the construction of a high-occupancy vehicle system through Pierce, King, and Snohomish counties. These lanes, reserved exclusively for buses and carpools, are a relatively easy, cost-effective way to move commuters faster and reduce traffic volume.

► Make a portion of the state excise tax on automobiles available for transportation expenditures. None of that tax revenue currently goes to pay for our road system.

► Coordinate the efforts of city, county, and state governments to improve our service to the public. We should tie funding to better planning and give incentives to leverage private development funds in order to stretch limited tax dollars.

► Establish a long-term plan to address the development of passenger rail in the Puget Sound region. After the options are studied, voters will have their say in financing, constructing, and operating such a system.

The debates earlier this year didn't resolve these transportation matters. But when our transportation needs are considered again, a simple increase in the gas tax just to continue business as usual will not be the correct approach. Long-range planning, coordination, and the policy proposals outlined here must be part of the final package.

It has been said that a first-rate state demands a first-rate transportation system. Now is the time for some first-rate action.

George W. Walk
Chairman, House Transportation Committee
Washington State Legislature

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Pacific Northwest Executive is a publication of the University of Washington made possible by a grant from Seafirst Bank.

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Printing
Craftsman Press

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Pacific Northwest Executive is published four times a year in January, April, July, and October by the Graduate School of Business Administration, University of Washington. Permission is granted to quote, with credit.

Correspondence related to subscription or other business matters should be addressed to the Executive Editor, 336 Lewis Hall, DJ-10, University of Washington, Seattle, WA 98195, (206) 543-1819. We welcome requests for inclusion on our mailing list.

The purpose of *Pacific Northwest Executive* is to inform managers about economic, business, and public policy issues in the Pacific Northwest. The analyses, conclusions, and opinions expressed are those of the writers and not necessarily those of the University of Washington. Neither the University nor the financial sponsor of the magazine assumes responsibility for the views expressed, and publication does not necessarily imply endorsement.

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PACIFIC NORTHWEST Executive

A Regional Business Publication of the University of Washington Funded by Seafirst Bank

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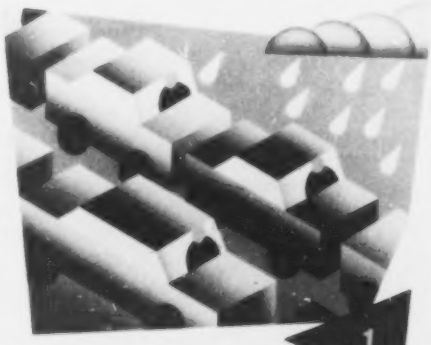
THE NORTHWEST'S TOP TEN

by Nancy L. Nihan and Joshua Foreman

Editor's Note: Transportation issues, made increasingly real and frustrating by the constant traffic problems, by the deterioration of roads and bridges, and by the hazards that compromise our safety and our environment, are now the focus of a new research center, based at the University of Washington. The Transportation Northwest Regional Center (TransNow) is one of 10 national research centers created by Congress in 1987 and financed by the U.S. Department of Transportation. TransNow, like its counterparts throughout the country, has gathered together researchers from various disciplines to examine present and future transportation needs. Researchers from the UW, Washington State, Oregon State, the University of Portland, Portland State, the University of Idaho, and the University of Alaska at Fairbanks are developing and evaluating new, cost-effective strategies that will move people and goods faster while making the most of existing resources. "The Northwest's Top Ten Transportation Problems" takes a look at the topics that TransNow will be pursuing.

A transportation system is like your body's bloodstream, and the movement of people and goods is just as vital to our society and economy as your veins and arteries are to you. The Northwest's transportation system is undergoing increasingly serious problems, and we need to start working on them before our region suffers the equivalent of a heart attack or stroke. In this article, we focus on the region's foremost problems, outlining the concerns so that we can all understand the issues and the alternatives.

The major difficulty that the Northwest faces as the 1990s approach is the need for taking action before the system reaches the crisis stage. The real solution to our transportation woes is for our region's leaders—in business and in government—to get involved in the process.



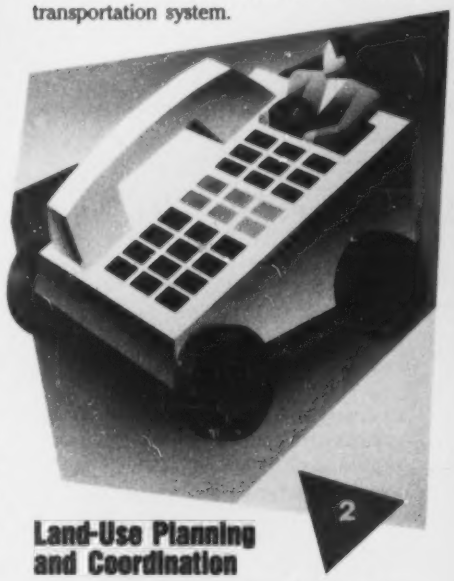
Urban Congestion

The most conspicuous transportation problem in the Pacific Northwest is urban traffic congestion. Seattle is rated sixth in the nation for its congestion—and local traffic expert Paul Brendle says that when it rains Seattle is the most congested city in America. But the Seattle metropolitan area is not alone; every city in the region suffers from congestion.

Fighting traffic is always aggravating, and delays are costly. A major accident on a freeway during the morning rush hour can make thousands of people late for work, and the productivity cost of those lost man-hours can be staggering. Even when traffic is flowing smoothly, long commutes represent a deadweight loss to the economy—one that can only be partially offset by car phones or dictating machines.

The downtown areas of Pacific Northwest cities are particularly affected by chronic traffic congestion. Merchants suffer as potential customers, deterred by traffic problems, take their business elsewhere, and the decline of retail activity—and commerce in general—leads to a downward spiral of urban blight, which includes falling property values (and municipal tax bases), high unemployment, crime, and other social problems. A city can lose its identity and cohesiveness when its heart decays into a slum; an effective transportation system is vital to keeping that heart healthy and strong.

What have other cities done to effect changes in urban congestion? Many metropolitan areas around the world have restricted the access of private automobiles to their central areas, via user fees or an outright ban. But demand-management solutions such as this have met with mixed success due to the political and social issues involved. Certainly there will be no long-term remedy to congestion problems without far-sighted land-use planning, effective mass transit, new transportation alternatives, and the coordinated effort of the entire transportation system.



Land-Use Planning and Coordination

Having one's own home is part of the American dream, but in many areas, even modest homes are far too expensive for most people to afford. Many families—even those in which two adults work full time—can only dream about home ownership. This social problem is also a two-sided transportation problem. First, when a community's transportation system doesn't work effectively, there is a higher premium placed on conveniently located land. Second, when the only affordable homes are on the urban fringes, long commutes are inevitable.

Instead of moving people to their jobs, perhaps we should be moving jobs to people. Telecommuting—the replacement of

TRANSPORTATION PROBLEMS

journey-to-work trips with telecommunications systems—is an exciting new prospect for some occupations.

The Puget Sound area's population will increase by more than 60 percent by 2020. We need to plan now to manage this growth effectively, and the transportation system is an essential feature of this planning. As our cities develop, they will, to a great extent, be locked into the choices that we make today. In 1988 the Puget Sound Council of Governments surveyed the area's elected officials and found general agreement that transportation funding must have the highest priority.

We need effective, long-range land-use planning to maximize our economic development and to maintain the unique quality of life we enjoy. This goal represents both a technical problem and a challenge to our political system, for areawide problems don't stop at political boundaries. Regardless of governmental or political divisions, major public investments for the future must be made. Our leaders need to plan for tomorrow while taking action today. But the qualities of wisdom and courage, which they will need in quantity, may be in short supply: researchers at Portland State University say that the area's biggest transportation problem is a "leadership gap."

Mass Transit and New Alternatives

Americans have been raised on the traditional ideal of rugged individualism. The emotional foundation of our ideas about transportation is the image of the lone cowboy, riding into town on his horse. The age of the cowboy is over, however, and we need a new vision of how to get from Point A to Point B. The solution to urban transportation problems includes mass transit.

On average, every five cars on Seattle freeways have a grand total of six people in them—that's just one passenger away from the cowboy model of one person per vehicle. Imagine how different rush hour would be if every driver had a passenger. Now imagine what the freeway would be like if those six people were riding in one minivan. Minivan networks organized by major employers are just one new solution to the urban congestion problem; freeway ramp metering and special lanes for high-occupancy vehicles are already in place and making a contribution.

And it won't be long, the car manufacturers say, before "smart cars" have onboard computers, which will be linked to a central system that monitors traffic conditions, so that the computers will plot the most efficient routes. Someday your high-speed car will drive you safely to the office, while you drink your coffee and read the newspaper. General Motors may offer a computer map system as an option in 1993, and the other companies involved in smart-car research have various prototype systems already in place.

Seattle is now studying the feasibility of an expensive light rail plan, hoping to emulate Portland's system, which has been a modest success (although funding and ridership problems persist). This proposal has stirred up a storm of controversy, and predictions for the plan's implementation range from total success to total disaster. The one thing that's clear today about the light rail proposal is the need for serious research—study that is coordinated with the rest of the transportation network and in the context of a comprehensive, areawide land-use plan. The issue is too important to be left to guesswork, unsupported hopes, or unfounded fears.

Nor should we allow ourselves to get so wrapped up in expensive, high-tech solutions that we forget two modest alternatives: bicycles and just plain walking. These are cheap, effective transportation modes that are not only energy-efficient and nonpolluting, but good exercise and a great way to enjoy the beauty of the Northwest.

Air Travel

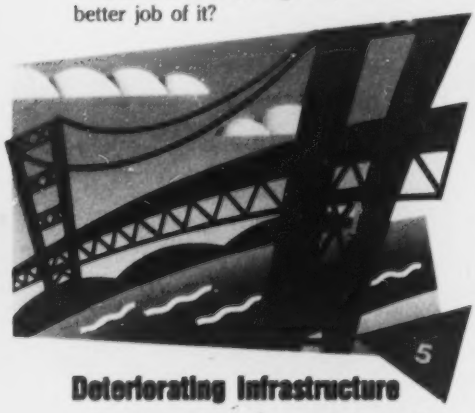
Executives are only too familiar with the problem of air traffic congestion and the resulting delays. What can be done? One simple idea is to charge each air carrier a landing and take-off fee based on the time of day of each flight, which would smooth out the peak load and let passengers decide for themselves whether traveling at peak hours is worth the extra fare. Better systems of traffic control will increase an airport's capacity and improve air travel safety, but eventually every airport's use will reach the saturation level. Both Sea-Tac and Portland International airports are expected to reach their capacity levels in between five and 10 years.

Ultimately, new airports will have to be built, and comprehensive long-range planning is essential for this process to be successful. Part of the process will be to research the ways in which airport noise can be reduced, so that airports will become more acceptable as new neighbors.

We also need to reduce congestion in the sky, to find a better way to accommodate

the needs of both airliners and small aircraft. And, given that air safety is on everyone's mind, we must investigate the performance records of our aging aircraft and the impact of deregulation on maintenance. How can today's airplanes, for example, be made more crashworthy, more resistant to disastrous fires?

Another problem we need to confront is inefficient and inequitable oligopolistic airline pricing strategies. Can we enjoy cheap, safe air travel without bringing back regulation, and, if we must regulate, can we do a better job of it?



Deteriorating Infrastructure

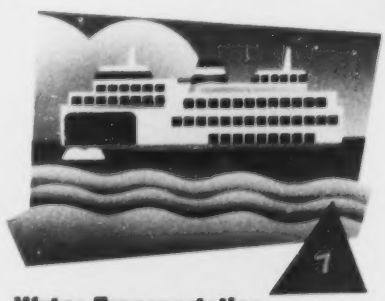
The dramatic collapse of "Galloping Gertie," the Tacoma Narrows bridge, just four months after its July 1, 1940 opening, has become part of our Northwest folklore. Fortunately, disasters on that scale are few and far between. A far more serious problem is the general deterioration of our transportation infrastructure: city streets, country roads, the interstate highway system, rail lines, and bridges are all aging, causing problems, becoming unreliable, and in need of maintenance (and, ultimately, replacement) at a rate greater than now planned or budgeted. This inevitable wear and tear is particularly severe in areas with harsh climates, such as the North Cascades and Alaska. Finding money for repair or replacement is only part of the problem—we also have to find the time. The closure of a busy street, freeway, or bridge can be a major traffic disruption.

Infrastructure deterioration is now at the crisis level in the major cities in the East, and it will be the West's turn next. We can learn from the mistakes of Eastern cities, however, and approach this problem in a more informed, businesslike manner. If we do our homework today, perhaps we'll have the solutions ready when we need them tomorrow.

Rail Travel

Railroads are the most efficient way to transport bulk goods long distances, and a healthy rail system can and should play an important role in our economy. Trains are a good way to move people, too; in Europe and Japan, fast, cheap, and safe railways are an important alternative to air travel. Here in America, however, the decline of the rail system has led to a proliferation of big tractor-trailer trucks, which tear up the highways, raising serious safety questions and consuming ever-scarcer petroleum fuels.

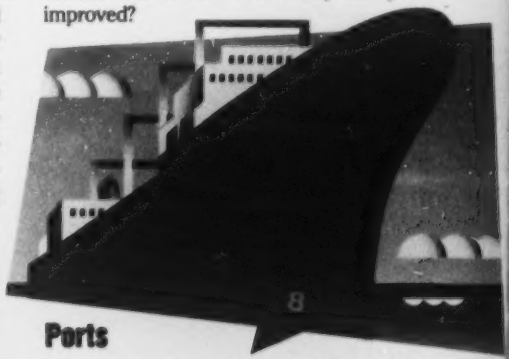
Our rail system can be viewed as a problem and a challenge, or as a solution and an opportunity. It's up to us to revitalize our railroads, to make them an integrated part of our overall transportation network. The railroads, like the air carriers and the truckers, must be able to anticipate future challenges while adjusting to a deregulated market and exploring better ways of transferring freight between transportation modes.



Water Transportation

Travel on the Columbia, Snake, and Willamette rivers, the Puget Sound, and the Pacific Ocean is an important part of our region's transportation system. But, like other modes of transportation, our waterways are suffering from safety, pollution, and reliability problems. The recent tragic oil spill in Valdez, Alaska, illustrates the potential for environmental disaster and should serve as a reminder that, with all the oil tankers that move in and out of the major ports in our region every day, we too have the capacity for such an accident. Without exception, our major waterways suffer from industrial, agricultural, forestry, and marine pollution. Treated sewage is discharged directly into the Puget Sound, and Northwest rivers, while rarely the source of contamination, act as carriers for other forms of hazardous waste. Unfortunately, it often takes a disaster to focus everyone's attention on the damage and the abuses.

And although we publicly mourn the loss of life from plane crashes and car accidents, life on the water is cheap in comparison. An appalling number of fishermen die every season. The large ferries that are an important part of the Puget Sound's transportation system aren't even equipped to evacuate all their passengers. Why not? Because the ferries can't sink? No, the officials rationale is, incredibly, that passengers should have no trouble swimming to safety—even though they may have to cross a mile of chilling water. Must Northwesterners wait for a disastrous loss of life before ferry safety is improved?

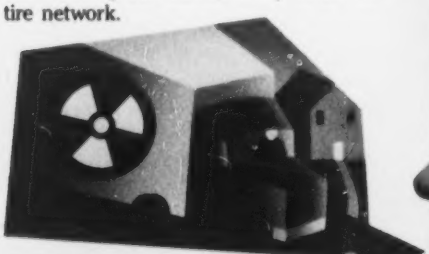


Ports

The ports of Seattle, Tacoma, Portland, and other Northwest cities are vital to our region's economy. We rely on them for the smooth, expeditious export of numerous regional products, including grain and timber, and our equally valuable import trade with Japan and the other Pacific Rim nations. Our maritime terminals are also essential for Alaskan commerce. The freight volume at the ports that line the Puget Sound and the Columbia River is projected to double—from 10 million metric tons per year to 20 million—by 2000. Alaskan ports, because of recent environmental protection restrictions, may not expand as rapidly, but, prior to the oil spill, the port of Valdez was ranked number one in the nation for the amount of tonnage it shipped and received (10.1 million metric tons per year).

Simple geography has given us an advantage: our region is America's natural gateway to the Pacific. But an advantage has to be put to good use if it is to provide beneficial results. Given that we don't want to lose our place to the ports of California, it's up to us to make sure that the future of our ports fulfills the potential of our geography.

The region's ports need to work together, planning and combining their efforts to promote trade and upgrade technology, instead of engaging in the unfortunate dog-eat-dog competition that too often characterizes their relationships. Imagine how it would be if the ports were to focus on increasing the size of the import-export pie for everybody, instead of squabbling over who gets which piece. The ports also need to coordinate their efforts with other modes of transportation to improve the efficiency of the entire network.



Safety and Environmental Concerns

Every form of transportation, regardless of whether it's used to move people or cargo, includes safety and environmental elements. Safety problems range from unsafe bridges to ferries without sufficient lifeboats, from near misses in the sky to big trucks that go too fast on the interstate. Oil and gas pipelines, another part of the transportation system, have, as recent disastrous explosions in this country and Russia remind us, their own safety problems and environmental risks. Nor can we be complacent about our water pipelines. Major breaks, and the resulting water shortages, are inevitable if nothing is done to prevent them.

The shipment of hazardous materials along waterways and through residential areas creates particular safety problems and environmental concerns. The Northwest's transportation system moves its share of toxic chemicals and more than its share of oil and radioactive materials. We don't need a Valdez oil spill—or any similar disaster—in the Pacific Northwest.

And just as drunk drivers kill thousands every year, drunk pilots and boaters are becoming a major safety hazard. The nation's problems with vehicle safety, air pollution, and acid rain are common to the Northwest as well. Traffic congestion, in fact, can be thought of as another form of pollution that threatens the quality of our lives.

Neither our legal system nor governmental regulations have solved our problems of transportation safety and pollution. Both responses are slow and inefficient: the incentives are weak, and effective guidance and an overall strategy are lacking. The regulatory process has been too fragmented and too politicized to succeed. We need to find new ways to solve these problems.

Transportation Financing

The ability of U.S. industries to compete in world trade depends on the efficient transportation of goods and materials; the correlation between transportation investment and economic prosperity is a strong one. Yet our nation's real investment in transportation systems has been steadily decreasing. Total federal, state, and local government expenditures in constant dollars reached a peak in the early 1970s and have been declining ever since. Similarly, expenditures for mass transit, aviation, and water transport peaked in the early 1980s and have now leveled off.

As public budgets for transportation investments lag behind existing needs, the private sector has had to take a more active role in financing transportation facilities. And, as the federal government lowers the amount of its assistance (particularly in the case of public transit), more of the financial burden is falling on state and local governments, which are not adequately prepared to direct that long-term commitment.

Another transportation resource that is often overlooked is the population of professionals who plan, build, and operate our region's intermodal network. Since the early 1970s, enrollment in university transportation programs has been dropping steadily, and, as the men and women who became experts during the years of massive investment in the interstate system now retire, there are fewer professionals to replace them. Although the interstate system is now built and our highway network is in place, the need for planners and engineers to devise, reconstruct, and operate our highway facilities has increased. State and regional transportation centers are addressing some of these needs, but much more must be done to prepare our future transportation leaders.

The Research Effort

The one theme that runs through each of the transportation woes outlined in this article is the need for additional research. We rely on science to find new solutions to our increasingly complex problems, but we need to do basic research today if we are to have the new results to apply tomorrow.

Our review of the Northwest's transportation problems illustrates the need for research in many disciplines—from engineering to economics, from political science and psychology to chemistry and biology. Transportation issues cross political, organizational, and academic boundaries, and politicians, executives, and scholars must work together to solve these complicated issues.

In a national survey conducted in 1988 by *Urban Transportation Monitor*, a biweekly newsletter produced by Lawley Publications, 70 percent of the respondents indicated that an inadequate level of resources is being devoted to transportation research. The other 30 percent, we believe, just don't understand the seriousness of the situation.

Transportation problems don't just go away. Ignore the traffic jams, the crumbling bridges, and the rusty pipelines, and they only get worse. And if you wait to pay for remodeling, repair, clean-up, or construction projects, you end up paying a lot more.

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REGION WATCH

Economic Developments in the Pacific Northwest

The expansion, in light of the mounting evidence, has lost its momentum. Overall growth in the national economy during the second quarter fell to 1.7 percent, the slowest rate in three years. This drop, coupled with the first quarter's revised growth rate of 3.7 percent, implies a significant slowdown in business activity for the year. Recent monthly statistics also show that consumer demand has cooled, industrial production has fallen, capacity utilization is down from its peak, durable goods orders are sluggish, and the growth in employment is at a much slower pace.

Whether this slowdown turns into a "soft landing" (with continued but less robust expansion in the national economy) or becomes a mild recession (with negative economic growth) remains an issue of considerable speculation. Economists view a soft landing—that is, a moderation in economic growth to a sustainable level of 1.5 to 2.0 percent without falling into a recession and without touching off higher inflation—as the most likely scenario, but one wonders whether we would know a soft landing if we saw one. Regardless of the language we use, certain industries and regions will feel the pinch more than others. The Puget Sound economy provides no hint of such a slowdown, but a number of resource-dependent communities may soon begin to experience the negative impacts of a downturn.

Table 1: Panel Forecasts
median annual percent changes

	REAL GROSS NATIONAL PRODUCT	IMPLICIT PRICE DEFLATOR
1988 actual	3.8	3.4
1989	2.6	4.6
1990	2.0	4.1

	NOMINAL PERSONAL INCOME	NON-AGRICULTURAL EMPLOYMENT	MANUFACTURING EMPLOYMENT
1988 actual	7.8	4.6	6.3
1989	8.5	4.3	4.0
1990	6.9	2.6	1.7
1988 actual	7.6	4.7	3.9
1989	9.0	3.8	1.5
1990	7.1	2.2	0.8
1988 actual	6.6	4.6	7.6
1989	7.8	4.3	4.0
1990	6.6	3.9	2.5

Forecast panel

Our panel of economists is predicting that the national economy will grow at 2.6 percent for the remainder of 1989 and 2.0 percent for next year (Table 1). Their consensus on inflation rates for 1989 and 1990 is largely a reflection of the Federal Reserve Bank's tighter monetary policies, as well as weak overall growth in the economy. The increases in food and fuel prices during the last quarter have been transitory, and most of the effects were passed through to consumers. The biggest potential for inflation may be future wage demands by the workers who have been forced into wage cuts or who simply haven't had a raise and now perceive opportunity in the tight labor market. To date, wage increases haven't materialized, nationally or regionally. Economic theory would suggest that as labor shortages develop, wages will accelerate, companies will raise their prices to cover increased labor costs, and the inflation rate will creep upward. Some economists have declared that the window of opportunity for wage increases has already passed and the demand for workers is lessening. This notion is being tested regionally by striking Group Health nurses and may lead to a labor dispute between the Boeing Company and its machinists union, which are negotiating a new three-year labor contract.

Turmoil in natural resources

The region's natural resource-based industries, and the communities that depend on those industries, face mixed prospects for the future. Although the outlook for agriculture has been generally good, with improved prices for major commodities, the fruit industry—particularly apple and cherry growers—is only now beginning to rebound after the Alar controversy. As agriculture continues to diversify into specialty products, the long-term prospect for net farm income improves.

The oil spill in Alaska's Prince William Sound in late March will undoubtedly take its toll on the Puget Sound's fishing and seafood processing industries. Nearly 12,000 Puget Sound residents are dependent on Alaskan fisheries resources—more than 90 percent of the seafood processed in the region comes from Alaska. Portions of western Washington have already been declared a "disaster loan area."

The region's mining industry has been showing signs of renewed health. Idaho's mining employment in June reached 4,000—the highest level in nearly four years. In the months to come, however, the industry will begin to slow in response to weakening mineral prices.

The forest products industry has been battered by recent developments. The amount of timber available from public lands has been significantly reduced, in part due to injunctions that have delayed awarded timber sales and expected reductions in the number of timber sale contracts. With fewer public logs available, stumpage prices have risen rapidly. The strong demand internationally for Pacific Northwest logs is also

pushing prices up and affecting the domestic supply. Lumber prices have been strong for the last three years; plywood and framing lumber composite prices are running about 10 percent above the five-year average for 1984-88.

Supply issues notwithstanding, the cedar shake and shingle industry must now endure the loss of a significant share of its market. The Los Angeles City Council has passed a law banning the use of wood shingles, which represents 15 percent of the regional industry's annual market of 6 million squares. A number of mills located in timber-dependent communities in western Washington and western Oregon will bear the brunt of this market loss.

The age of services

Much has been written about the national economy's transition to services in the last decade. Consumers are buying more services, the rate of productivity is higher in manufacturing than in services, and there is increased service sector input in manufactured goods. Patterns of employment growth in the United States and in the three Pacific Northwest states during several recent business cycles show some interesting regional variations on this national phenomenon.

The Bureau of Labor Statistics at the U.S. Department of Labor notes that the long business expansion of the 1980s is different from those of the 1960s and 1970s. Nearly 85 percent of all job growth nationwide has been in the service sectors during the 1980s, and the contribution of the service producing sectors has been 12 percent higher than in the earlier expansions (Table 2). Retail trade and personal and business services account for most of the swing to services in this decade; the government's role as a contributor to job growth has diminished, as has that of the manufacturing sector.

In Washington, the move to services was apparent before the 1980s expansion. This state's job growth, in fact, was more dependent on services during the 1960s and 1970s than was U.S. job growth. During the late 1970s expansion, the manufacturing sector's contribution to employment growth was 3.3 percentage points lower than it was during the 1960s expansion. This drop was offset by a rapidly expanding construction sector, fueled by the simultaneous expansion of five ill-fated nuclear power plants. The sudden collapse of the Washington Public Power Supply System construction program, in combination with the continued decline of manufacturing jobs during the 1980s, brought the total contribution of goods production to employment gain down sharply.

Nonetheless, manufacturing has been a significantly stronger contributor to job growth in Washington during the 1980s expansion than it has nationwide, due primarily to Boeing's significant growth, the revival of aluminum smelting, and the expansion of a relatively small high-tech sector. The Boeing Company has added more than 40,000 jobs in the state during the last five years. Within the services sector, the retail trade and business service patterns resemble the national data, but government remains a much stronger contributor to total job growth in Washington than in the nation.

In Oregon, the swing to services has been much less dramatic during the three long expansions. The percentage of employment growth coming from goods production and manufacturing has declined slightly in the last 15 years.

In Idaho's much smaller economy, which is tied closely to the fortunes of natural resources, large swings are apparent in the relative contribution of goods production and services to employment growth. A dramatic upsurge in manufacturing employment in the 1960s was followed by an equally dramatic drop in the late 1970s. An even greater gain has occurred in the 1980s, and services account for far less of the employment growth in this state than elsewhere in the region.

These differences in the pattern of employment growth in the goods producing and service sectors indicate structural shifts in the regional economy. Washington's goods versus services share over time resembles the larger national economy, but the smaller economies of Oregon and Idaho display distinctly different features. Washington, and the Puget Sound region in particular, is emerging as a regional service center for the entire Northwest. And, at present, the three-state region is substantially more dependent on manufacturing industries for job growth than the nation is.

Correction

In the "Economic Developments" section of the July issue of *Pacific Northwest Executive*, we noted that both supply and demand in Northwest forests were undergoing significant changes. The figures we cited for the amount of timber harvested in Washington and Oregon in 1987 were erroneously listed in millions of board feet. The correct numbers are 6.4 billion board feet in Washington, 8.2 billion in Oregon.

Table 2: Composition of Employment Growth by Industry During Major Economic Expansions, 1961-1988
In percent contribution

	UNITED STATES			WASHINGTON			OREGON			IDAHO		
	1961-1969	1975-1980	1982-1988	1961-1969	1975-1980	1982-1988	1961-1969	1975-1980	1982-1988	1961-1969	1975-1980	1982-1988
TOTAL NONAGRICULTURAL	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
GOODS PRODUCING INDUSTRIES	27.0	27.7	15.5	24.6	26.2	12.9	25.2	21.1	19.7	20.8	14.7	29.1
Mining	−0.3	1.8	−1.6	0.0	0.3	0.1	0.2	0.4	−0.2	0.5	1.6	−0.8
Construction	4.8	7.3	8.3	4.5	9.4	5.6	4.4	5.5	4.9	−1.7	2.2	2.4
Manufacturing	22.5	18.6	8.8	20.1	16.8	13.3	20.6	15.3	15.0	22.1	10.9	27.5
SERVICE INDUSTRIES	73.0	72.3	84.5	75.4	73.5	81.1	74.8	78.8	80.3	79.2	85.3	70.9
Transportation, Public Utilities	3.3	4.4	5.7	4.2	5.1	3.3	3.5	5.1	2.0	−1.2	5.9	−1.1
Wholesale and Retail Trade	20.7	24.2	28.2	22.5	25.0	24.9	24.0	27.6	27.4	19.1	21.6	23.2
Finance, Insurance, Real Estate	5.2	6.6	7.3	6.3	6.4	5.2	6.7	11.8	4.5	4.2	10.5	−8.5
Services	21.9	26.7	38.5	20.2	22.4	34.8	20.6	21.7	38.2	27.0	23.6	35.7
Government	21.9	10.3	9.2	22.1	14.8	13.0	20.1	12.5	8.2	30.1	15.2	21.6

Puget Sound Business Conditions Survey—The Midyear Report

Signs of a slower paced economy, now evident at the national level, have yet to be seen within the Puget Sound region. The Puget Sound economy continues to churn along at a pace faster than that of the nation, and a number of firms in the area are expanding output, increasing sales, and adding employees. The economic prospects of regional businesses for the near term look very bright.

These are the results of the *Pacific Northwest Executive's* midyear survey of senior executives and business owners within the three-county Puget Sound region. The purpose of this biannual survey—which is conducted in collaboration with the Greater Seattle Chamber of Commerce, the Seattle Economists Club, and the *Seattle Times*—is to determine current business conditions and future expectations from the business owners themselves. The sample frame consists of all private sector establishments that employ 250 or more workers in King, Pierce, and Snohomish counties, plus a random selection of smaller firms. The sample also includes a number of publicly owned organizations, most of which are electric utilities.

The midyear survey questionnaire, which closely resembled the instrument we used in our inaugural survey last January, asked for each respondent's evaluation, in terms of eight specific variables, of his or her company's performance during the last 12 months (July 1988 through June 1989) and his or her expectations for the next 12 months (July 1989 through June 1990).

The Puget Sound Business Conditions survey was mailed out to 511 businesses in June 1989. We received useable responses from 201 (92 large firms and 109 smaller businesses), for an overall response rate of 39 percent. Collectively, these firms employ 104,715 workers—about 7 percent of the work force in the three-county area. The distribution of the respondents by size, location, and industry is very close to that of the sample frame (Table 1). As a result, the returns are quite representative of the Puget Sound economy.

The responses and information presented in Table 2 are weighted by employment. Although Boeing did participate in this survey, the company's responses are not included in the overall results. Given the employment weighting scheme that we use, Boeing's responses would simply outweigh those of all the other survey participants, and thus bias the results. Although Boeing is the largest employer within the area, the survey was intended to reflect the business prospects of the remainder of the Puget Sound's firms—even though the success of many of these firms is directly tied to the fortunes of the aircraft manufacturer.

According to the June business conditions survey, Puget Sound companies continue to perform well in terms of sales (Table 2). The median response was a 2.5 percent to 10 percent increase in sales in the last 12 months. Wages, other costs, and prices charged by these firms for their goods and services rose modestly, which resulted in increased profits after taxes (the median response was in the "higher" category). The January survey results had indicated that net after-tax profits were relatively flat during the 1988 calendar year. Nearly two-thirds of the business community increased their capital expenditures between the latter half of 1988 and the first half of 1989. This was substantially different from the previous survey, in which half of the respondents said that they had made no major capital expenditures in 1988. A significant share of the midyear respondents made substantial employment additions; the majority of January respondents noted that their employment figures had not changed.

Table 1: Sample Characteristics of the Puget Sound Business Conditions Survey

	PERCENT OF SAMPLE FRAME	PERCENT OF RESPONDENTS
Large firms	44	46
Small firms	56	54
King County	72	74
Pierce County	17	15
Snohomish County	11	11
Services	80	74
Goods	20	26
TOTAL	511	201
Response rate equals 39%		

Continued Optimism

Smaller businesses, according to recent studies, tend to anticipate an economic downturn. With less of a cushion than larger firms, small businesses feel the effects of economic change quickly. Although the initial stirrings of an economic downturn are appearing in small businesses across the nation, the responses from such firms in the Puget Sound region indicate continued optimism with respect to increased sales and profits. In fact, more than two-thirds of the smaller firms expect that their sales will continue to expand—from 2.5 percent to more than 10 percent—during the next 12 months. This expected increase in sales, however, will occur with only modest employment gains and increased capital expenditures.

During the last 12 months, the area's goods producing firms experienced a higher rate of change, in terms of wages, nonwage costs, prices charged, and sales, than did the service sector companies. Employment in service firms, however, increased more rapidly than that in goods producing firms. Capital expenditure figures for both sectors are fairly close. Among the goods producing sector, manufacturing firms performed particularly well, with increased sales, employment, capital expenditures, and profits during the last year. Business service firms, in contrast, experienced only modest gains.

A closer look at the Puget Sound region reveals that business conditions are positive irrespective of which of the three counties the firm is located in. During the past 12 months, firms in King County experienced higher rates of change in sales, employment, capital expenditures, and net after-tax profits, compared with respondents located in Pierce and Snohomish counties. For the next 12-month period, however, firms in these

Table 2: Overall Survey Results
weighted percent of 291 respondents

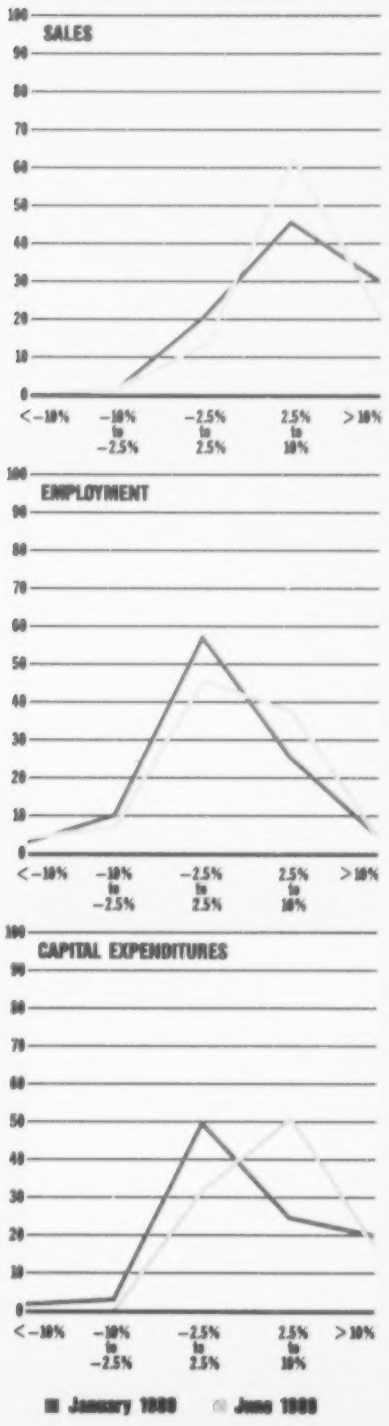
	MUCH LOWER <−10%	LOWER −10% TO −2.5%	NO CHANGE −2.5% TO 2.5%	HIGHER 2.5% TO 10%	MUCH HIGHER >10%
SALES					
Last 12 months	1	4	20	48	27
Next 12 months	0	2	14	63	21
PRICES					
Last 12 months	0	10	44	36	10
Next 12 months	0	12	47	32	9
COSTS					
Last 12 months	0	6	45	47	2
Next 12 months	0	3	40	54	3
NET AFTER-TAX PROFIT					
Last 12 months	4	20	17	41	18
Next 12 months	2	4	43	28	23
WAGES					
Last 12 months	0	1	43	55	1
Next 12 months	0	0	14	83	3
INVENTORIES					
Last 12 months	6	3	61	23	7
Next 12 months	1	3	65	31	0
CAPITAL EXPENDITURES					
Last 12 months	0	4	35	43	17
Next 12 months	0	0	32	51	17
EMPLOYMENT					
Last 12 months	3	15	39	36	7
Next 12 months	4	7	46	38	5

two counties have higher expectations for increased sales, prices charged, wages, nonwage costs, and profits earned than firms in King County.

The total survey sample's outlook for the remainder of 1989 and first half of 1990 is much more optimistic than that of the previous sample. Sales are projected to rise more sharply than previously expected, while price increases are expected to moderate. The sample firms expect that nonwage costs, capital expenditures, and employment patterns will resemble those of the previous 12-month period. More than 80 percent of the businesses surveyed believe that there will be a 2.5 percent to 10 percent wage increase in the months ahead, which indicates a tightening labor market. Both service sector and goods producing firms anticipate high rates of increase in wage costs during the next 12 months. Goods producing companies expect higher rates of increase in nonwage costs than do the service sector firms. This is a reversal from the January survey results, in which service sector firms were the ones anticipating higher costs.

By and large, the business owners' responses confirm the results of the survey we took six months ago in terms of the past performances and future expectations of Puget Sound firms. For the majority of area businesses, sales continued to increase, wages and nonwage costs moderated, and net after-tax profits increased. The outlook for the Puget Sound region continues to be bright—and business owners were even more optimistic in June 1989 than they were in January 1989 (Figure 1). The respondents anticipate even greater gains in sales, employment, and capital expenditures than previously expected. Forecasts of wage and nonwage costs, prices charged, and net after-tax profits remain relatively unchanged from the previous survey. In sum, the optimism felt by Puget Sound business owners counters the prevailing national mood of an impending economic slowdown.

Figure 1: Twelve-Month Business Forecast, January versus June 1989 Surveys
in weighted percent of respondents



Municipal Solid Waste Disposal: Where Will All the Garbage Go?

by Michael Rahm

For most of the 19th century and well into the 20th, refuse disposal was a private matter. In small town and rural America, food wastes were fed to animals or composted, combustibles were burned, and what remained frequently wound up in an inconspicuous corner of the property. Even in the most densely populated cities, garbage collection was limited. Many apartment buildings operated incinerators connected to the central heating system, and recycling was the domain of the junk man.

The growth of American cities and a heightened awareness and concern about public health prompted many of the major population centers to take control of their refuse. Backyard dumps began disappearing as municipal collection systems developed, and local governments operated or hired regular waste collection. Disposal systems, however, remained rudimentary. Virtually every community had a convenient stretch of marshland or other low-value real estate, and refuse was dumped off there, then burned.

While often unsightly and malodorous, these dumps were generally viewed as mildly unpleasant necessities. Most taxpayers were insulated from the effects of the neighborhood dump, and the impact of air pollution, seepage, noise, and odor on the human and natural environments in the immediate vicinity of the dump was, for the most part, ignored.

The rapid growth in personal income after World War II and the advent of the suburb began to have a significant impact on the old-fashioned dump. The volume of material that Americans discarded began to increase rapidly as packaging became more elaborate and the personal economic incentives to conserve and recycle diminished. As the land adjacent to or downwind of the dump was more intensively developed, people's tolerance of vermin, odor, and smokey haze rapidly disappeared. The dump, no longer a welcome neighbor, was replaced by the sanitary landfill.

The Volume of Trash

The sanitary landfill, in which compacted refuse at the old dump site was covered with soil, resolved many of the public's immediate concerns. With the cessation of open burning, air pollution was effectively eliminated, and burying the refuse substantially reduced vermin and odor problems. In most areas, unfortunately, the sanitary landfill was only an interim solution, for without open burning a larger volume of waste, much of which had a higher organic content and produced methane and other effluvia, had to be covered.

By the 1960s, many communities were faced with rapidly escalating costs for solid waste disposal. Landfill sites, now more remote, required the construction of transfer stations so that collection haulers could dump refuse for consolidation and transportation by tractor-trailers, barges, or rail cars to the landfill. Land acquisition became more expensive as a result of rising land costs and the need to secure buffer zones.

Concerned residents in some areas also questioned the potential impacts of the contaminated runoff and seepage on surface and groundwater systems. Not only should new landfills be more remote, the public insisted, they should be located in impervious soils to minimize this potential risk to water quality. By the late 1960s, the demand for air quality safeguards prompted the virtual elimination of backyard and apartment incinerators in urban and suburban areas, and added yet another increment of waste to the landfill.

Even though existing disposal sites began to overflow and new locations became increasingly expensive to open, there seemed to be no economical alternative. By the mid-1970s, the energy crisis stimulated the public's interest in garbage as a fuel source and in resource conservation. Plans began in earnest for a number of waste-to-energy facilities, and private recycling centers became permanent fixtures in communities throughout the nation. Despite their good intentions with these projects, however, most cities and towns continued to rely on their landfills.

The Solid Waste Stream

By the mid-1980s, the municipal solid waste stream totaled 165 million tons a year and occupied a volume in excess of 400 million cubic yards. Burying all this garbage was the equivalent of digging basements for every new single-family home built in one year—twice. Not all waste is buried, of course. Recent data indicate that nearly 10 percent (by weight) is recycled and another

Table 1: Municipal Solid Wastes in the United States, 1960–1984
In millions tons, recycled quantities included

Paper and Paperboard	29.8	43.1	62.3
Glass	6.4	13.7	13.9
Metals	10.4	13.6	13.7
Plastics, Rubber, and Leather	2.4	8.3	11.1
Food Waste	11.2	13.4	16.8
Yard Waste	15.5	22.1	23.8
Street Waste	10.0	12.9	15.6
Other	6.3	8.9	10.4
Total	92.0	136.0	163.8

SOURCE: U.S. Environmental Protection Agency (Franklin Associates), 1986

4 percent is incinerated in waste-to-energy plants. Nevertheless, more than 85 percent of the waste stream ends up as part of a rapidly growing manmade mountain.

The largest single component of the waste stream (Table 1) is paper and paperboard, which includes everything from old newspapers (about 20 percent of the total) to packaging materials such as cardboard and candy wrappers (more than 45 percent of the discards). The surge of paper and paperboard in recent years reflects the growth in convenience packaging, the proliferation of computers, and the boom in special-interest publications.

The quantity of discarded glass more than doubled during the 1960s and early 1970s, as bottlers replaced reusable beverage containers with nonreturnables. The market for nonreturnable bottles is now saturated, and this factor, combined with the use of alternative beverage containers and the passage of several state bottle bills, has sharply reduced the growth in glass refuse. The tonnage of metal waste has had a similar history, with almost no increase since 1975. Aluminum has replaced steel in many manufacturing processes, and plastics are now replacing both. Plastic products, the most rapidly expanding element in the waste stream, are generally not biodegradable.

Raw organic materials—food waste and yard waste—have declined in quantity and will continue to do so. The drop in food wastes can be attributed to the growth in prepackaged prepared foods and the increased use of garbage disposals, which shifts some of the load to the sewage system. The volume of yard waste increased in the 1960s because of new restrictions on backyard burning, but it has leveled off as more communities restrict or eliminate yard waste disposal.

More than one-third of all the waste we generate consists of packaging, which is essential to product integrity and the secure shipment and distribution of goods ranging from consumer electronics to chocolate bars. Although packaging manufacturers and those who produce the goods that go into the boxes and wrappers have found it profitable to reduce or eliminate some packaging, an attempt to legislate the total amount produced could have serious economic and safety consequences.

Food and yard wastes, which total almost 25 percent of the garbage we produce, could be sharply reduced if people were required to compost all vegetable matter. This solution, however, raises the possibility of recreating the backyard dumps that municipal collection originally eliminated. It would also be hard to imagine legislation that would limit publications (more than 10 percent of the waste stream) or that would set minimum performance standards for a wide range of consumer durables (another 15 percent of our waste).

Product reuse is usually aimed toward the recyclable beverage bottle. If applied nationally, bottle bills, which were originally passed to reduce litter, might reduce the overall municipal waste load by 3 to 4 percent. The bottlers themselves, however, strongly oppose bottle bills—such measures have failed three times in Washington—and a national bill seems unlikely.

The public views recycling as one of the most effective and environmentally sound ways to reduce the municipal wastes that are buried in landfills. Paper fiber, if it's sorted by grade, can be repulped a number of times without seriously degrading its quality. Aluminum, steel, and glass are readily reprocessed at a cost below that of reducing bauxite, iron ore, or silicon dioxide. Aluminum and some ethylene-based plastics can be reclaimed at a substantial savings. Much of the organic load, particularly yard waste, could be composted into a commercially salable product.

Nevertheless, recycling has yet to realize its promise. While the nationwide percentage of reclaimed materials has grown in the last 30 years, it has only increased from 6 to 9 percent (Table 2). Achieving the potential savings that recycling holds has not been easy, largely because recycling relies on volunteerism. While there is an active market for recyclables, the highest value is offered for materials that are pure. Newsprint, computer paper, and office papers command relatively high prices, but only when no other papers are present. Color-sorted glass is more valuable than mixed glass. Certain types of plastic, such as beverage bottles and polyethylene milk jugs, have high recycling value, but most plastics do not.

As a result, do-it-yourself recycling has had relatively little impact on the waste stream. The bulk of the recycled wastes are supplied by the stores and distribution centers that have a real market incentive to recycle cardboard, by the legions of youngsters who collect newspapers for school or scout troops, or by the individuals who gather up aluminum beverage cans, which have a high market value.

The use of solid waste as a fuel to generate electricity or steam or as a feedstock to produce methane or ammonia is another alternative preferable to landfill disposal. About three-quarters of the garbage we produce consists of combustible or compostable organic materials. Solid waste is not a high-grade fuel source when measured pound for pound against the energy content of fossil fuels or wood, but it is the only energy

(continued on page 14)

The Alternatives

Given the enormous volume of material buried in municipal landfills every year and the problems with this solution, the search for alternatives continues. Traditionally, the hierarchy of preferred alternatives begins with waste reduction, includes reuse, recycling, and waste-to-energy projects, and ends with landfill disposal. The position of landfill on the list is in direct contradiction to reality. The alternatives, however, all carry very real implementation problems.

Waste reduction, for example, runs headlong into the realities of a modern economy.

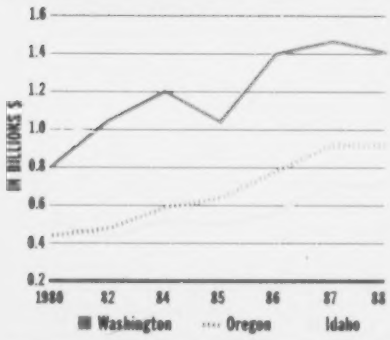
Table 2: Recycled Share of Municipal Wastes, 1960–1984
in millions tons, percent of category

	TONS	PERCENT	TONS	PERCENT	TONS	PERCENT
Paper and Paperboard	5.3	17.8	8.6	20.0	12.9	20.7
Glass	NA	NA	0.5	3.7	1.0	7.2
Metals	NA	NA	0.3	2.2	0.9	6.6
Plastics, Rubber, and Leather	0.3	12.5	0.2	2.4	0.2	1.5
Food, Yard, and Street Waste	NA	NA	NA	NA	NA	NA
Other	NA	NA	NA	NA	NA	NA
Total	5.6	6.1	9.6	7.1	15.0	9.2

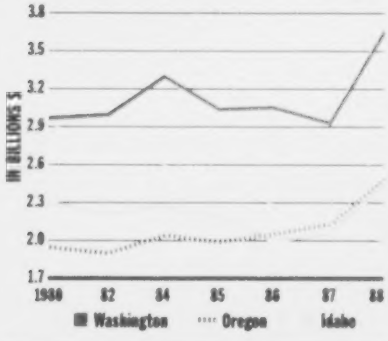
SOURCE: U.S. Environmental Protection Agency (Franklin Associates), 1986

Pacific Northwest Agricultural Production Indicators[1]

FARM PERSONAL INCOME



AGRICULTURAL PRODUCTION



NUMBER OF FARMS[2]
In thousands

YEAR	WA	OR	ID
1965	48.5	43.0	31.2
1970	41.0	34.5	28.5
1975	34.0	38.0	24.1
1980	38.0	35.0	24.4
1982	39.0	36.0	24.2
1984	38.0	37.0	24.6
1985	38.0	37.0	24.6
1986	38.0	37.0	24.0
1987	38.0	37.0	23.0
1988	38.0	36.5	22.5

TOTAL VALUE OF AGRICULTURAL PRODUCTION
In millions $

WA	OR	ID
703	495	556
892	614	723
1,994	1,179	1,442
2,948	1,934	2,322
2,981	1,885	2,180
3,277	2,017	2,269
3,031	1,975	2,189
3,042	2,026	2,004
2,898	2,125	2,042
3,670	2,450	2 431

FARM PERSONAL INCOME[3]
In millions $

WA	OR	ID
283	186	238
356	227	274
886	390	434
858	540	518
1,056	471	417
1,188	583	521
1,026	627	490
1,389	777	552
1,486	918	717
1,392	900	698

LIVESTOCK AND LIVESTOCK PRODUCTS
In millions $

YEAR	WA	OR	ID
1965	235	186	175
1970	306	254	269
1975	454	321	386
1980	831	565	750
1982	892	566	744
1984	940	571	742
1985	885	594	755
1986	886	599	714
1987	924	630	775
1988	1,029	682	857

CATTLE AND CALVES
In millions $

WA	OR	ID
76	92	100
113	141	168
132	155	231
311	312	483
335	280	400
330	277	405
287	265	413
294	254	389
352	289	453
481	335	521

MILK
In millions $

WA	OR	ID
87	47	52
125	59	73
213	92	127
383	158	240
440	184	290
467	188	281
478	189	293
469	183	280
475	187	273
496	187	294

NOTES:

1. Unless otherwise noted, figures are those of the Crop and Livestock Reporting Services of Washington, Oregon, and Idaho. We thank the personnel of these offices for their efforts to provide us with data. Readers should be aware that some numbers are subject to revision. The term "NA" means that these numbers were not available. A "0" means that the dollar amount is less than one-half million.
2. In 1975 the definition of a farm was changed to include places with agricultural sales of $1,000 or more.
3. Bureau of Economic Analysis, U.S. Department of Commerce.
4. U.S. Department of Agriculture.
5. Revised to include all farm income and farms.
6. The total value of Idaho's field crops in 1988 is estimated by assuming that the value of beet production in 1987 is $166 million.
7. Department of Agricultural and Resource Economics, Oregon State University. Figures prior to 1980 do not include the value of bulbs, turf, and miscellaneous specialty products.
8. The value for mint is given for mint oil, not fresh mint, in Oregon.
9. Idaho aquaculture statistics supplied by the Fish Breeders Association, Buhl, Idaho.

FIELD CROPS[6]
In millions $

YEAR	WA	OR	ID
1965	295	154	365
1970	378	171	436
1975	1,077	533	1,017
1980	1,432	743	1,511
1982	1,350	679	1,366
1984	1,509	706	1,445
1985	1,230	641	1,216
1986	1,053	578	1,219
1987	972	573	1,200
1988	1,361	681	1,497

WHEAT
In thousands of bushels and millions $

WA		OR		ID	
Bushels	Value	Bushels	Value	Bushels	Value
90,828	121	28,399	30	47,973	62
92,800	137	20,717	30	41,582	58
147,880	553	58,040	220	63,220	215
160,220	638	77,400	308	96,030	-351
138,880	561	63,500	255	94,290	350
160,350	553	68,945	230	81,480	289
128,250	437	56,040	189	72,030	229
116,850	293	58,405	153	81,750	196
114,285	309	52,920	151	85,500	221
124,620	503	51,800	212	75,520	300

SUGAR BEETS
In millions $

ID
37
48
73
152
118
123
128
150
160
NA

FRUIT AND NUT CROPS
In millions $

YEAR	WA	OR	ID
1965	98	57	8
1970	122	61	7
1975	209	76	13
1980	370	126	27
1982	389	142	30
1984	462	127	28
1985	491	167	32
1986	681	180	28
1987	517	195	29
1988	712	224	32

WASHINGTON APPLES
In millions $

1,000 Tons	Value
818	80
896	70
1,300	134
1,503	248
1,397	252
1,475	326
1,825	349
1,530	488
2,300	312
1,950	494

PEARS
In millions $

WA	OR
10	18
19	11
30	24
55	38
52	37
55	40
69	53
76	49
67	44
89	61

SWEET CHERRIES
In millions $

WA	OR
1	7
10	13
20	13
30	16
38	22
41	14
37	16
50	25
68	33
61	39

BERRIES
In millions $

WA	OR
NA	21
NA	22
13	19
17	31
29	48
22	44
29	51
25	68
32	64
32	64

GOVERNMENT[4] PAYMENTS
In millions $

YEAR	WA	OR	ID
1965	40	24	29
1970	58	23	48
1975	7	5	9
1980	9	6	8
1982	77	31	52
1984	171	78	132
1985	155	71	122
1986	299	127	223
1987	292	127	234
1988	207	98	167

AVERAGE NET INCOME[3, 6] PER FARM
In $

WA	OR	ID
5,938	4,320	7,028
8,805	6,812	9,614
27,735	13,833	18,133
21,132	12,206	21,352
27,877	13,083	17,231
31,263	15,756	21,179
27,800	16,946	18,919
36,553	21,600	23,000
39,105	24,811	31,173
36,632	24,904	31,822

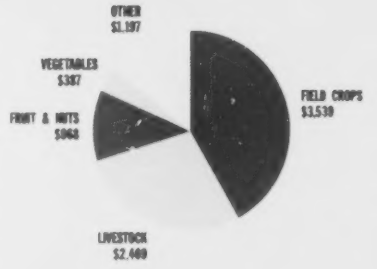
FARM ASSETS[4] Including households
In millions $

WA	OR	ID
NA	NA	NA
NA	NA	NA
7,763	6,438	7,286
15,600	13,356	13,917
18,928	14,793	15,353
19,314	14,188	14,776
17,342	12,978	12,740
15,842	12,241	11,469
15,376	12,140	11,753
15,551	12,153	11,864

RATIO OF[3] PRICES RECEIVED TO PRICES PAID
US 1977 = 100

115
109
113
97
85
86
79
77
79
81

AGRICULTURAL PRODUCTION, 1988
Pacific Northwest, In millions $



AVERAGE VALUE OF FARM LAND AND BUILDINGS
price per acre

YEAR	WA	OR	ID
1965	NA	NA	NA
1970	NA	NA	NA
1975	NA	NA	NA
1980	736	587	680
1982	822	705	830
1984	941	698	814
1985	823	579	749
1986	812	521	644
1987	723	479	567
1988	699	446	592

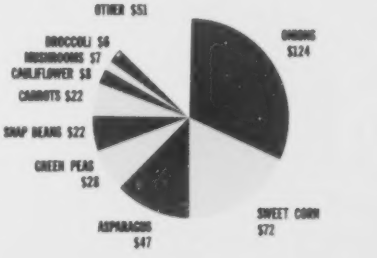
VEGETABLE CROPS
In millions $

WA	OR	ID
41	38	8
42	41	11
94	93	26
118	126	25
145	97	27
150	141	30
156	111	26
152	118	35
173	138	47
197	145	45

SELECTED VEGETABLES FOR 1988
In millions $

	WA	OR	ID
Onions	27	60	37
Sweet Corn	33	30	9
Asparagus	47	NA	NA
Green Peas	21	7	NA
Snap Beans	0	22	NA
Carrots	17	5	NA
Cauliflower	NA	8	NA
Mushrooms	7	NA	NA
Broccoli	NA	6	NA

VEGETABLE PRODUCTION, 1988
Pacific Northwest, In millions $



POTATOES
In millions $

YEAR	WA	OR	ID
1965	29	18	119
1970	51	27	144
1975	152	78	294
1980	193	91	451
1982	198	82	321
1984	293	112	420
1985	220	96	338
1986	266	97	388
1987	244	90	349
1988	272	91	356

BARLEY
In millions $

WA	OR	ID
16	18	24
20	19	40
50	23	97
94	30	172
110	34	191
143	41	217
110	39	173
75	35	150
67	30	137
85	36	145

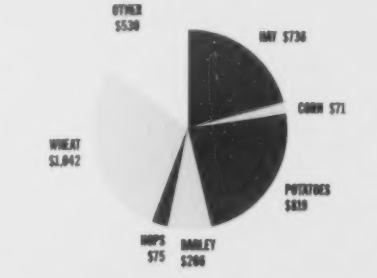
HOPS
In millions $

WA	OR	ID
16	3	3
17	4	3
33	8	5
86	17	8
93	26	16
87	15	16
66	17	15
58	18	13
49	16	11
54	17	4

NURSERY AND GREENHOUSE PRODUCTS
In millions $

WA	OR[7]
NA	20
NA	29
NA	50
90	133
94	132
100	192
98	153
94	187
100	210
130	242

FIELD CROPS, 1988
Pacific Northwest, In millions $



OTHER FIELD CROPS, 1988
In millions $

	WA	OR[8]	ID
Hay	222	216	298
Corn (Grain)	41	10	20
Corn (Silage)	24	NA	NA
Seed and Grass	NA	211	NA
Mint	35	50	12
Dry Beans	21	NA	63
Oats	5	15	6
Dry Peas	20	NA	11
Lentils	11	NA	6

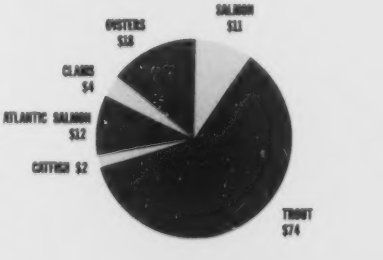
SELECTED FRUIT AND NUT CROPS, 1988
In millions $

	WA	OR
Apricots	4	NA
Grapes	45	5
Strawberries	7	31
Raspberries	NA	12
Peaches	10	4
Blackberries	0	11
Filberts	0	16
Cranberries	6	7
Prunes	3	3
Blueberries	5	8

AQUACULTURE, 1988
In millions $

	WA	OR	ID[9]
FISH			
Salmon	6	5	6
Trout	3	1	70
Catfish	NA	NA	2
Atlantic Salmon	10	2	NA
SHELLFISH			
Clams	4	NA	NA
Oysters	17	1	NA
Misc.	1	NA	NA

AQUACULTURE, 1988
Pacific Northwest, In millions $



(continued from page 11)
source that has a negative price: if you don't burn it, you have to pay to bury it.

The economics and politics of waste-to-energy projects, unfortunately, are complicated by the lack of effective control over the possible contaminants that municipal waste might contain. Waste-to-energy plants require elaborate and expensive equipment to prevent the emission of particulate matter and gaseous compounds. The efficacy of the technology is still uncertain, and, because of that, no one wants to live anywhere near a waste incinerator. Other stumbling blocks include the need for transfer stations, long-distance hauling, and the final disposal of the ash and emission control precipitates. Although incineration reduces the volume of waste by 80 percent, the remainder has concentrated levels of heavy metals and other compounds that require burial in a special-purpose landfill.

Composting or pyrolysis to produce methane or ammonia is a variant of the waste-to-energy concept and shares many of the same benefits and problems. Waste volume is reduced and there is a salable product. But state-of-the-art facilities are experimental and expensive.

The Environmental Hazards

Although it's clear why the alternatives are preferable to landfills, it is equally understandable why landfills remain the predominant disposal method. The basic technology is simple and relatively inexpensive—largely because the environmental impacts have been misunderstood or ignored. This situation is changing, however, and the economics of the community landfill are no longer as clear as they once were.

The decaying organic matter in landfills generate two major by-products: methane and a chemically and biologically active soup, the leachate. Methane, a major component of natural gas, can usually be vented to the atmosphere or, in some cases, be cleaned and sold to a natural gas company. Or it can be a serious hazard, as in the case of Seattle's Midway landfill, where soil conditions allowed methane to collect and migrate underground to nearby homes.

The more serious environmental hazard of a landfill is usually the leachate, the product of the household chemicals, paint, motor oil, cleaning solvents, and insecticides that people discard. Although much of the leachate spectrum of metals and volatile and nonvolatile organics is not hazardous in dilute quantities, some elements remain toxic at minute levels and can contaminate the water that we tap for drinking and irrigation.

Environmentally secure closure is expensive. The landfill must be sealed with an impervious cap, which can cost up to $50,000 per acre, to divert rainwater and runoff, and the postclosure monitoring and maintenance costs typically run as high as $50,000 to $100,000 annually. Communities faced with such closures often find that their disposal costs double or triple within a year.

The Environmental Protection Agency is in the process of promulgating new regulations that would require every landfill, regardless of its size or local conditions, to maintain sophisticated monitoring systems, including a number of active test wells, around the landfill site. Because accurate monitoring can cost up to $100,000 per year, these regulations could prove prohibitively expensive for many small communities. The likely result is that small local landfills will begin to disappear and very large regional landfills will be established. The new landfills will be completely self-contained, with impenetrable linings and monitoring wells to verify that neither methane nor leachates leave the site.

Large, modern landfills have tremendous economies of scale. Doubling the capacity of a landfill, for example, increases the cost by less than 50 percent. Yet, although a large landfill is more economical to operate, the savings can be offset by the cost of the transfer stations needed to consolidate loads and the expense of long-distance transport. And, finally, there is the problem of finding an acceptable location for an immense landfill.

Washington: A National Leader

Until the 1980s, municipal solid waste disposal was not a priority issue in Washington. Although Seattle had some difficulty siting new landfills in the 1960s, most communities had access to ample landfill capacity. The state's role in the regulation of garbage began in 1969 with the Solid Waste Management Act, and functional standards for disposal sites, directed primarily at the most obvious nuisance and health aspects of landfills, were initiated in 1972.

The state, in response to a growing inventory of problems, set up waste management priorities in 1984, listing waste reduction, recycling, and waste-to-energy facilities as the preferred alternatives to landfill sites. Washington's first major regulatory step was taken in 1985, with the establishment of stringent minimal standards for operating landfills. By the end of 1989, for example, all landfills will be required to install monitoring wells, which the state is helping finance, and to institute regular programs of groundwater testing. Surface water runon and runoff will be strictly controlled, and new standards for fencing, interim refuse covering, and record keeping will be more rigorous.

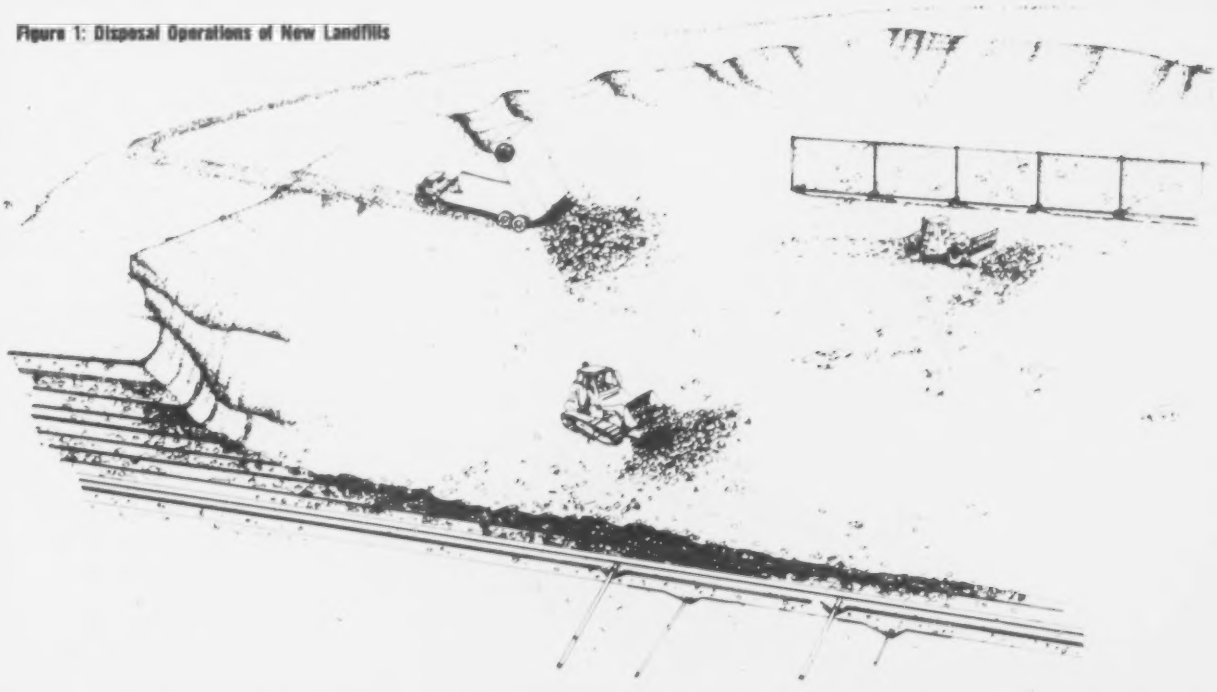
Under Washington law, new units in existing landfills, as well as new landfills, must have impermeable liners, systems to monitor and vent gases, and mechanisms to collect and treat leachate and gas condensates (Figure 1). Each closed landfill will be covered with a two-foot-thick cap and will receive regular groundwater and gas monitoring. These requirements should meet or exceed the new standards expected from the EPA and put Washington—along with Wisconsin, California, and New Jersey—on the list of states that lead in the environmental regulation of solid waste.

Washington is also a leader in the cleanup of existing sites. By aggressively pursuing potential environmental problems at both hazardous and nonhazardous sites, seven municipal landfills in the state now receive federal Superfund assistance and three others are under consideration. Four of these sites are in Spokane County, where a sole source aquifer supplies the drinking water for most of the residents of Spokane and surrounding communities. Two other sites are in Pierce County, where wells are also sensitive sources of drinking water, and the last is Seattle's Midway landfill. In addition to actively seeking federal Superfund assistance, the state also has its own Initiative 97 cleanup fund, which went into effect earlier this year.

The last element of the statewide program, the Sprinkel Bill, outlines plans for a 50 percent recycling rate by 1995. The state will also impose a 1 percent surcharge on garbage collection to fund technical assistance, education and tracking programs, awards for "environmentally friendly" packaging, a tire cleanup program, and the development of markets for recyclables.

Because of the state's environmental aggressiveness, many city and county landfills are in trouble, and ratepayers are beginning to feel the impact. In Vancouver, Wash-

Figure 1: Disposal Operations of New Landfills



The daily disposal operation of each 15- to 30-acre landfill consists of trucks that deliver the waste, movable screens to prevent loose trash from blowing away, bulldozers to spread the waste, and compactors to compress it. Each day's waste is covered with six inches of soil. The underground liner system includes a natural clay base, a plastic liner, and various layers of gravel and soil, compacted clay, filter fabric liners, and protective soil. Landfills are closed using an intermediate cover, a clay cap, top soil, and new vegetation.

ington, and surrounding Clark County, state inspectors found that primary landfills were contaminating the groundwater; in addition to cleanup efforts, the landfills will be forced to close. County officials are now negotiating with a regional landfill near Boardman, Oregon, and Clark County is about to embark on an urban curbside recycling program to reduce the solid waste load by 30 percent. Meanwhile, the cost of disposal has risen from $15 per ton in the early 1980s to $47 in 1989 and will hit $68 per ton next year.

Spokane's story has been similar to that of Vancouver, although the eastern Washington city's sole-source aquifer complicates the situation. Serious leachate contamination was discovered almost a decade ago, and Spokane earned the distinction of having one of the earliest municipal waste Superfund sites. The city opted for a waste-to-energy facility, which will be on line in 1991. Forty-four percent of the cost of the $134 million facility is being paid by the state, a factor that will enable the county to hold the incinerator "tipping fee" to $55 per ton (compared with $15 per ton four years ago at the old landfill). Spokane is also developing a curbside recycling plan to boost the 15 percent of its waste stream that is now recycled to 25 to 30 percent by the time the incinerator opens, and to 45 percent in the next decade.

Tacoma has also turned to a waste-to-energy facility to solve part of its disposal problem. With one Superfund site within its city limits and only one remaining landfill, which has limited capacity and a $60 per ton tipping fee, the city plans to provide refuse-derived fuel for the new combustion system that Tacoma City Light is installing in its steam generating plant. Although most of the plant's energy will come from coal and wood waste, the city is building a refuse separation center to extract the most combustible share of its municipal waste. Because this 300 tons of fuel per day, which represents about half of the collected tonnage and two-thirds of the volume, will be converted to fuel, the life of the landfill will increase from three years to 10.

When Seattle's last city dump and marshland landfill closed in the 1960s, the city established landfills outside the area, developing transfer stations and a transportation system to support them. But in less than 20 years these sites were filled, and Seattle, without its own landfill space, has serious problems with methane and leachates at its already-closed Midway and Kent landfills. The city now estimates that it will spend $79 million to clean up the two landfills.

Seattle has decided to embark on one of the nation's most ambitious recovery programs: to recycle more than 60 percent of the refuse it generates. Because the city manages the entire collection and disposal system, it can closely regulate waste activities from the garbage can to final disposal. Under Seattle's three-point program, yard wastes—which account for one-quarter of the disposal tonnage in Seattle and about 35 percent of the organic material—are now banished from regular collection. Customers can have this material picked up regularly by a composting contractor for $2 per month, compost it themselves, or take it to a transfer station.

Traditional waste will be picked up as usual, but only in standard city-owned cans. If the homeowner pays for one can per week, only one can will be emptied. Participants in the voluntary recycling program receive other city-owned containers for paper, glass, and metal, which recycling contractors pick up regularly at no charge. As an additional incentive to recycle, the city offers residents a half-can rate—and a smaller container—for normal garbage collection.

Seattle's program depends on the homeowner, who, in spite of taking the time and trouble to maintain separate containers and keep track of the waste that goes into them, is paying virtually the same garbage bill. Disposal, including handling at transfer stations and long-distance hauling, had been accounting for about half of the cost of removing a ton of solid waste. But collection costs, the other half, have increased significantly as a result of the extra pickups per household. The revenue now generated by the sale of recyclable materials roughly equals the handling costs, so the total for removing a ton of solid waste remains nearly constant. In the future, however, the gap between the prices received for recyclables and the costs incurred will widen.

Oregon: Gradual Pragmatism

In contrast to Washington's recent sweeping policy changes, Oregon's waste management strategy has been more incremental in nature. Oregon began developing its policies on landfill sitings, designed to reduce groundwater impacts, in the late 1960s. Because the state applied location restrictions and runoff controls relatively early, Oregon has had fewer problem landfills that require major cleanup efforts.

Nevertheless, runoff and leachate contamination caused by the steep terrain and heavy rainfall of the Oregon coast have led to the closure or imminent closure of a number of municipal landfills. In the coastal counties of Curry and Coos Bay, landfills have been replaced by incinerators, and, in other instances, solid waste is now or soon will be trucked to a regional disposal site near Corvallis. With the notable exception of Portland, however, the majority of Oregon communities have adequate landfill capacity for most of the 1990s, with only a few environmental problems.

If, as expected, the Environmental Protection Agency institutes the need for expensive monitoring wells and testing at every landfill, a number of smaller communities may decide to shut down their landfills in a move to regional sites. Either way, landfill disposal will become substantially more expensive, and many Oregon residents and businesses will notice large increases in their garbage bills.

Oregon, another pioneer in recycling, was one of the first states to pass a bottle bill, which levied a refundable deposit on all beverage containers. As a result of the 1972 bill, almost 95 percent of the beverage containers in the solid waste stream has been removed—for a total reduction estimated at 6 percent.

In 1983 Oregon passed the Opportunity to Recycle Act, which mandates that every municipality with a population of more than 4,000 must provide monthly household collection of recyclables. Newspaper and cardboard, glass, metals, and motor oil are the standard collection items; local areas have the option of including old batteries, some plastics, and yard waste. Although only 69 cities are required to participate in the program, there are now more than 100 municipalities with on-route collection. Unfortunately, household participation so far has been weak—only 15 percent statewide. Given the convenience of curbside pickup, these household participation rates may seem weak, but they illustrate clearly the extent to which incentives and public education must be a part of the recycling habit.

The one place in Oregon with a genuine disposal crisis is the Portland metropolitan area. The St. Johns landfill, which served the city for 90 years, will close in 1990, and the public has rejected plans for several nearby landfills and an incinerator. Although a landfill site south of the city was finally approved, Portland's waste utility pursued an offer to ship its refuse to a new regional landfill near Arlington along the Columbia River. Oregonians decided in 1988 that although the Arlington alternative was more expensive than the local landfill, it was preferable. Shipments by truck are expected to begin as the St. Johns landfill closes.

Idaho: Little Has Changed

Idaho, which has only one large metropolitan area, still has access to potential landfill space for its solid waste, and tipping fees generally remain under $15 per ton. Boise recently purchased 2,200 acres adjacent to its landfill north of the city to guarantee access to the space it will need for the foreseeable future. With one notable exception, municipal landfills in Idaho have escaped serious environmental problems, largely because most of the populated areas receive fewer than 24 inches of rain per year and the state's soils are not highly permeable. As in Oregon, however, the existing landfill situation may change radically when the new EPA regulations come into effect.

Kootenai County, which is just east of Spokane and shares the same aquifer, has recorded leachate seepage at its 15-year-old landfill, and the site is scheduled to close by the end of 1990. The county is planning to spend $3.5 million on an impervious cap and monitoring and gas collection systems. Meanwhile, officials are analyzing the possibility of a new local landfill site or of exporting waste to eastern Washington or western Montana. Plans for a recycling program, which could reduce the disposal load by 25 percent, are still in the preliminary stage. Although there are private recycling centers in Boise and a few other communities, Idaho's ability to recycle is limited by its sparse population and the lack of a well-developed market for recyclables.

Regional Landfills: The Option of the Future?

Despite concerted efforts in Washington and Oregon to use waste reduction and recycling to limit municipal waste, the majority of refuse generated in the Pacific Northwest will, for the foreseeable future, require landfill disposal. Waste-to-energy projects will probably remain limited, so new landfill capacity is a high priority for much of the region. It seems inevitable that a number of large, relatively remote, regional landfills will be developed to serve the needs of the more populous counties.

This, in fact, is happening. Regional landfills are already in operation, have been approved, or have been proposed in central Oregon, in eastern Oregon, in Klickitat and Yakima counties, and near Ritzville and Kittitas. Seven counties in southwest Washington are trying to form a consortium to develop a single landfill.

Not all of these landfills are likely to be built, of course, and not all the garbage that we generate will go into them. But these landfills will be a major factor in the region's solid waste disposal until well into the next century.

Michael Rahm is a Seattle-based economist.

LIGHT RAIL
HEAVY POLITICS

by G. Sc

on traffic, and the public's awareness of the problem is as acute as the figures that the transportation experts show to illustrate the tremendous increases in delay that commuters face. In San Francisco, the flow of traffic across the Bay Bridge has slowed so much that delays increased 100 percent in one year.

Transportation facilities are rapidly running out of capacity, and areas of heavy congestion have spread the traffic peak from a few minutes to several hours. Understandably, commuters traveling in such congestion become frustrated to the breaking point and demand that their policy-makers solve the problem. The common joke in transportation circles, however, is that people are really interested in getting their neighbors on public transit so they can drive their cars on open roads.

Urban Development and Travel Demand

The land development process creates the need for travel between people's homes and their jobs, shopping, and other activities. That travel generally takes place on a highway, bus route, or rail system. The transportation system, in turn, affects where land will develop. The more travel that takes place on the system, the lower the system's level of service.

The common joke in transportation circles is that people are really interested in getting their neighbors on public transit so they can drive their cars on open roads.

In the late 1800s, streetcars and commuter railways altered the urban shape of Chicago, Philadelphia, and other Eastern cities, and we've seen the impact that freeways have had on the shape of our cities since 1950. The most recognizable symbol of the Puget Sound's growth is downtown Seattle's skyline, which looks quite different in 1989 than it did in the mid-1970s.

The Puget Sound Council of Governments has projected that an additional 1.5 million residents in the next 30 years will add even more pressure for land development for housing and employment sites. This growth is a sign of the economic strength of industries such as Boeing, which is nearing its pre-1970 employment levels, our port facilities, which are the closest route to the Orient from the Midwest, and local high-tech firms, such as Microsoft.

Although some people have argued with the population and employment forecasts, no one predicts substantially slower growth in the Puget Sound region. And the experts agree that most future growth will take place in the suburbs in such a dispersed fashion that these areas will be very difficult to serve with conventional public transportation. National transportation leaders have lamented the fact that our newly developed cities have grown in a manner that is too dense to serve with automobiles and not nearly dense enough to serve with public transit.

Several factors have been indirectly conspiring to increase travel demand. While the population of the Puget Sound increased 34 percent since 1970, the number of registered vehicles grew by 76 percent, and vehicle miles traveled shot up 123 percent. These increases were the result of rapid growth in the number of two-income households, which created a need for more automobiles and more travel, and a rising level of personal income, which created the demand for more goods and the added transportation to consume those goods.

In addition, we've enjoyed relatively cheap gasoline in the 1980s, and vehicle efficiency, in terms of miles per gallon, has almost doubled in the last three decades. In 1989 the combination of low fuel prices and increased efficiency resulted in out-of-pocket operating costs that were 37 percent *less* in real terms than what we were paying in 1950. Add to this the fact that even in dense downtown areas such as Seattle, Washington, D.C., and Los Angeles less than 50 percent of all drivers pay to park their cars, and you can understand why public transportation systems have been forced to scramble for patrons.

Transportation Systems and Traffic Conditions

Although rapid increases in urban development have created an extraordinary increase in travel demand, we have not been adding freeways, transit service, or ferry service at the same rate. There were, for example, 30 miles of freeway in the Puget Sound area in 1960. By 1980 the total was 250 miles, and the projection for 2000 is only 303 miles.

In 1966 the Puget Sound Governmental Conference proposed a freeway network, based on traditional transportation planning, that would supply adequate transportation services for the amount of urban development that was projected. The transportation planners, however, hadn't counted on the national freeway revolt, which began in San Francisco in the mid-1950s and spread to nearly every urban area. As interstate highways began to penetrate urban areas, people realized that the social and environmental costs of the roadways far outweighed their benefits.

In Seattle, as well as other major urban areas, the freeways planned to satisfy future travel demand simply were not built. In addition, King County voters rejected a rapid rail system in 1968 and again in 1970, in the belief that the downtown would not develop as forecasted and that future growth was actually going to take place on the east side. We see now, 20 years later, that development took place in both areas.

Even relatively minor changes to the Puget Sound's transportation system have met with opposition or complications. Look at the problems Seattle Metro had locating a northern bus base and the difficulties that Metro and the state's Department of Transportation have had connecting State Route 520 to the express lanes of I-5 so that dual-mode buses running from the east side could get into the new downtown bus tunnel.

Simply stated, the problem is that we didn't provide additional transportation systems because we disagreed with the mode, the study assumptions, or the anticipated impacts. At the same time, we allowed development to continue, and we permitted that growth to occur in such a way that many areas are now very difficult to serve with efficient transportation systems.

The result of these past actions—letting demand rise

and holding supply constant—is congestion on Puget Sound freeways and arterials. The amount of vehicle delay, according to an estimate by the Federal Highway Administration, will increase a remarkable 272 percent between 1985 and 2005.

This delay to the traveling public represents a tremendous loss—nearly $780 million in 1986—to the Puget Sound economy. Frustrated commuters arrive at the office or at home with higher stress levels, and the delivery of goods and services is held up. Seventeen percent of the businesses on the east side of Lake Washington, according to a Seattle-King County Economic Development Council survey, are considering moving because of congestion. Many of these firms will relocate to the outlying areas, where they may for a time be free of congestion —until other businesses do the same.

Rail Myths and Realities

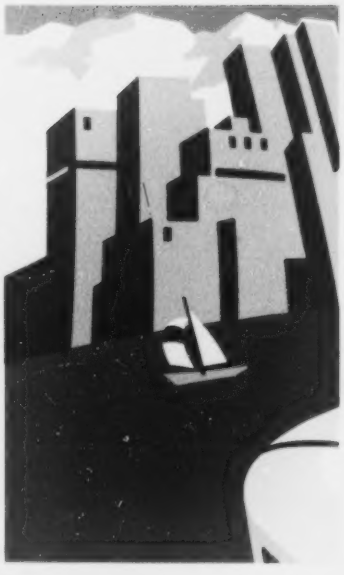
People have a natural tendency to reach for technological solutions to the problems they encounter in their urban environment. Policy-makers who travel to other urban areas bring back ideas, and public officials from other cities visit Seattle and relate their experiences. Sometimes this activity produces an interest in alternatives that are not part of a reasonable or appropriate transportation planning process. Civic pride sometimes drives policy-makers to accept technical solutions that are unrelated to the problem at hand.

During the late 1960s, for example, the nation's aerospace program was facing a decline. President Nixon felt that many of these well-trained and highly competent engineers and scientists could be used to develop much-needed transportation technology. The theory was that the same people who got us to the moon could surely find a way to get us downtown. Unfortunately, a trip to the moon cost hundreds of millions of dollars; a ride downtown should cost only a few dollars. This push for new technology, which produced plans for people movers and rail vehicles, was largely unsuccessful and failed to achieve any of its initial goals.

► **The Politics of Congestion.** Until very recently, the popular press would have had us believe that the solution to our congestion problem lay in the implementation of a regional light rail system. Some of the local policy-makers who have touted rail as a panacea for congestion actually served on the steering committee for a $2 million study conducted by the Puget Sound Council of Governments and Seattle Metro. The Multi-Corridor Project, in a chapter entitled "Traffic Impacts," makes it clear that rail has no advantage over other alternatives in reducing congestion.

The surprising conclusion that rail is no more effective at reducing traffic than buses has never been prominently reported. In fact, members of the multi-corridor steering committee, when running for office, pointed toward the application of a rail system as essential for providing congestion relief.

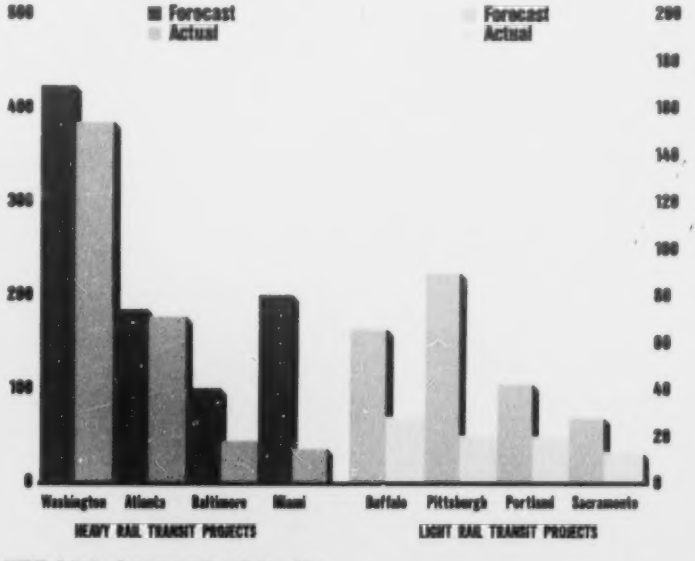
► **The Lure of the Automobile.** One of the primary motives for installing an expensive transportation system is to lure people out of their cars (particularly single-occupant vehicles) and onto public transit. The data demonstrates, however, that most riders of new public transportation systems were already bus riders or carpool or vanpool patrons. It is very difficult, even with heavy congestion levels, to attract commuters out of their cars. Portland calculates that its light rail system, "MAX," removed only 3,000 cars on a daily basis from the streets and highways. Given that MAX cost $214 million to build, each automobile removed from the Portland highway system represents $71,000 in capital expenditures. Unfortunately, many of those 3,000 automobiles are still driven to a park-and-ride lot.



► **Land Use.** Proponents of rail systems often point to highly dense cities in Europe and the Eastern United States to demonstrate that rail systems can influence urban form. A comprehensive study by the U.S. Department of Transportation in 1979 concluded that the "available evidence does not show that recent American and Canadian rapid rail transit investments have had major effects on urban structure."

Recent research doesn't refute this study's conclusions, but points out that if land-use changes are to take place, the solid commitment of state and local elected and administrative officials is required. San Fransisco's BART system and Washington's Metro both roused neighborhood

Figure 1: Weekday Rail Passengers
In thousands



SOURCE: Federal and agency reports, preliminary data.

action over rezoning and redevelopment. It may be that we have to insist that some higher authority control the development at transfer stations if the Puget Sound's taxpayers are to invest in a rail system.

► **Patronage.** Perhaps the single biggest problem for today's rail transit proponents is the poor performance record these systems have for attracting forecasted passengers. When the actual 1987 ridership figures for eight U.S. cities were plotted against the patronage forecasts, the results were disappointing (Figure 1). Remember that these forecasts for weekday passengers were used to justify the investment decision and commitment from the Urban Mass Transportation Administration for funds from the federal government. In some cities, transit authorities have backed away from their first forecasts and are using lower figures in an effort to convince people that they have, in fact, attracted more than their forecasted patronage.

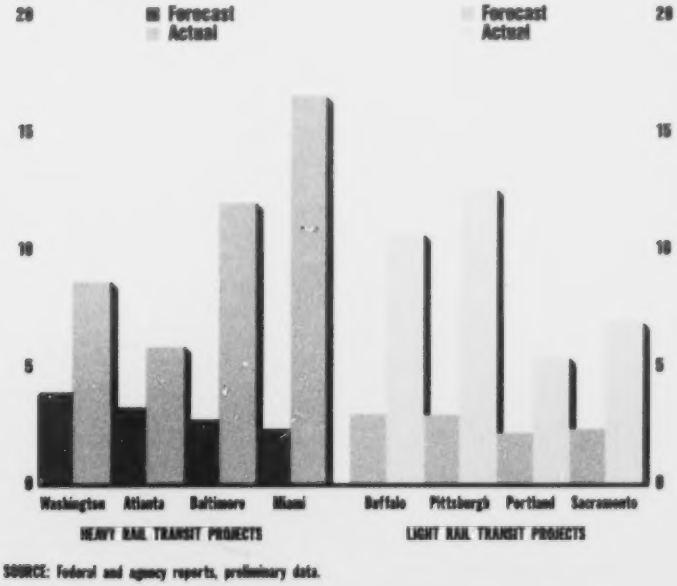
The environmental impact statement for Portland's MAX rail system forecast a patronage of 42,500 by 1990, but MAX's ridership numbers have dropped from an initial 24,000 to 19,000 in 1988. And 19,000 trips per day (8,500 commuters), contrasted with the 4 million daily automobile trips made in the Portland area, cannot noticeably reduce the city's congestion. It's also important to note that the construction costs of Portland's light rail system, which has prompted civic pride and given the city a new symbol of sophistication, were paid in large part by the federal government (83 percent) and the state (12 percent).

Patronage is one of the key elements in determining the cost effectiveness of a project; another is capital cost. When patronage is half or less of what was forecast, the subsequent cost effectiveness becomes a serious question. An evaluation of patronage forecasts in the U.S. cities that have implemented light and heavy rail transportation systems shows that bad assumptions can account for only about half of the difference between the forecast and the actual patronage; the remainder has not yet been explained. Perhaps we should improve the forecasting process or improve the supervision of the process.

► **Cost.** A review of rail projects from Atlanta to Sacramento shows that transit systems need to be evaluated on a case-by-case basis to determine whether rail saves money. Federal and agency reports indicate that Portland's light rail system came closest to its forecasted annual operating costs, and Pittsburg had the largest gap between anticipated and actual expenses. Atlanta's and Washington's heavy rail systems cost nearly 200 percent more than what was forecast, and Miami was 30 percent higher. Capital costs too were consistently underestimated, except in Pittsburgh. Underestimated costs combined with overrated patronage have resulted in unrealistic costs per rider, which is a key evaluation measure. In nearly every instance, the actual cost per rail passenger was at least double (Figure 2). These estimates are preliminary and subject to change, but the conclusion is unalterable.

► **Sex Appeal.** People unquestionably have a greater affinity for a regional rail system than a network of bus routes. Often the public compares a dirty, crowded bus running on congested streets with a supermodern rapid rail system such as BART and announces that it likes trains better than buses. We should really measure people's attitudes toward clean and comfortable buses that operate on their own rights-of-way and do not contend with congestion. Community Transit, for example, operates clean coaches with comfortable recliner seats on high-occupancy vehicle (HOV) lanes to provide service from Snohomish County to downtown Seattle. This type of system is arguably superior to a rail system that stops at each station and has inflexible routing at both its origin and its destination.

Figure 2: Total Cost per Rail Passenger
In 1988 dollars



SOURCE: Federal and agency reports, preliminary data.

The View from the Administration

Since the beginning of Ronald Reagan's administration, the Urban Mass Transportation Administration (UMTA) has not been an ally of rail transportation. At a speech in Denver in 1988 UMTA associate administrator Brian Vincent stated, "Light rail vehicles can only operate where tracks are in place, and these tracks can only be used by light rail vehicles, regardless of whether all their available capacity is being utilized."

For the past several years, the administration has tried to eliminate the discretionary capital program and establish a new fund that would apportion capital to each ur-

ban area on the basis of a preestablished formula. Congress has funded the discretionary capital program at about $400 million a year, and we can anticipate that it will continue to do so in the future. The Urban Mass Transportation Administration is then faced with the task of dividing $400 million a year among more than 40 cities—which have submitted proposals for rail projects that total more than $60 billion.

The competition for this money is intense, and political influence can play a strong role. Seattle Metro won a substantial share of this discretionary money for its bus tunnel, and the UMTA will probably want to see how effective its original investment has been before it puts more money into additional technology for the region.

Regional Studies

The Puget Sound Council of Governments and Seattle Metro in 1983 began a comprehensive Urban Mass Transportation Administration Alternatives Analysis of the corridor running north from Seattle into Snohomish County. This study produced 30 technical reports and examined all reasonable technology alternatives, including rail transit.

Rail systems in the north corridor, according to the study's ridership forecasts, were no better than bus systems in their ability to attract patrons. The study also found that rail's slightly higher speeds were not enough to make up for the additional transfer and access time needed to get to the rail stations. A bus system, which could operate very much like a rail system, could also be flexible enough to travel off the guideway in low-density suburbs.

In its Multi-Corridor Project, a comprehensive analysis of the area's three highest priority corridors, the Puget Sound Council of Governments and Seattle Metro in 1986 looked at the possible routes that high-capacity transit systems might take and three basic transit alternatives. These alternatives consisted of the expansion of the existing all-bus system on high-occupancy vehicle lanes, the development of a high-capacity bus system on some busways, and an integrated light rail and bus system. The multi-corridor study revealed that capital investment in a rail system over the lifetime of the project offers little return in comparison with either the existing bus system or a high-capacity bus system.

In a regional study completed in June 1989, Glen Pascal, an independent consultant and a *Seattle Times* columnist, interviewed 14 local transit experts, who had varying points of view regarding the development of transportation systems. These professionals, who had decades of experience on both the technical and the political side of rail transportation, agreed that light rail would not have an impact on traffic congestion or land development unless substantial local measures were taken. They also expressed concern about the ability of rail to serve suburban developments and questioned whether the voters would approve large bond issues once they understood what the costs and service level would be. The experts believed that projects such as this served the ribbon-cutting desires of policy-makers, not the public, and they felt that a large capital project would divert attention away from other solutions or other actions that would be needed along with high-capacity transit.

What To Do?

There are three basic ways to deal with the congestion that increased traffic causes.

► **Control Land Use.** The adoption of land-use plans that help reduce travel is an important and essential goal. Increased residential and employment development densities and a balance of jobs and housing in the suburbs would reduce the number of trips and their length and encourage various public transportation alternatives.

While land-use controls are often discussed and promoted, however, the fact remains that local officials dictate land use, and their interests are associated more with land development than land management. There are, unfortunately, few good examples of effective land-use controls in the United States.

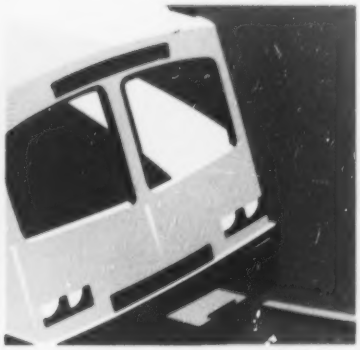
If land-use controls or plans are going to be established, they may have to come from a higher authority than local government. Perhaps regional or state financial resources should be invested only in local areas that promote responsible growth. The regional control of sewer services, highway development, and high-capacity transit lines and stations might encourage more desirable development. The idea is basically to provide public money to those areas that "behave" and deny funds to those that don't. This may seem like a heavy-handed response, but allowing congestion to build indefinitely is also a harsh measure—and one that hurts both residents and businesses.

► **Add to the Transportation System.** Adding the appropriate highways, arterials, and transit systems to a growing urban area is necessary to maintain strong economic activity. New facilities, however, are often controversial, expensive, and, because of social, environmental, and funding constraints, incapable of solving every mobility problem. In developed urban areas, rights-of-way for highway expansion are unlikely to be obtained.

It seems obvious now that except for some construction to eliminate highway bottlenecks and add arterial lanes in the suburbs and perhaps an expressway in the eastern and southern suburbs, very little will be added to the highway system in the central Puget Sound area and nothing at all in the core development area. Most planners and policy-makers recognize that the addition of freeway lanes won't relieve congestion, but merely offers a short-term fix. Additions to the transportation system will have to focus on the increased use of high-occupancy vehicle lanes.

In a 1989 survey by the Washington State Transportation Center and the state's Department of Transportation, 99 percent of the people sampled were aware of high-occupancy vehicle lanes, 86 percent felt that having such lanes in Seattle is a good idea, and 80 percent said that HOV lanes are not unfair to those who can't use them.

In some cities, transit authorities have backed away from their first forecasts and are using lower figures in an effort to convince people that they have, in fact, attracted more than their forecasted patronage.



These results echo those of a Seattle Metro survey conducted in 1988, in which 90 percent of the respondents said that they supported the idea of bus and carpool lanes, and 64 percent said that more HOV lanes were needed in King County.

► **Manage Travel Demand.** Travel demand management encompasses the various incentives and plans to encourage people to reduce the amount of their travel, to change modes of travel or shift travel times, or to substitute an alternative for travel. To reduce travel, we have the option of increasing parking costs, reducing the parking supply, and initiating tolls or a gas tax. To spur drivers into leaving their cars at home, we could improve transit service, reduce transit fares and the cost of a pass, give preferred parking spaces to high-occupancy vehicles, and establish car pool by-passes and signal timing. To shift travel times, businesses can establish four-day work weeks and flex time, and parking lots and toll booths can institute time-of-day pricing. To substitute alternatives for travel, people can telecommute, have video conferences, ask for home delivery, shop by telephone and computer, and use video services for training and education.

Managing travel demand is now receiving more attention in transportation planning. And for the first time, many urban areas are giving it serious consideration instead of lip service. The four-day work week, flex time, telecommuting, and video conferencing are alternatives that private sector companies have been exploring. As congestion builds and employers find it difficult to attract workers to certain locations, four-day work weeks and other attractive options may become more commonplace.

If people know exactly what a transit system will do and if they're willing to pay a premium to have one technology over another, that's their choice.

In large urban areas, including Seattle, 50 percent of the single-occupant vehicles that travel to central business districts receive free or heavily subsidized parking. This subsidy can be enormous—monthly parking for one vehicle can cost from $100 to $300 per month in Seattle. Tax laws allow companies to provide their employees with free parking but to pay only $15 per month toward a transit pass. Given our congestion problems and our desire to get people to join carpools or vanpools or take a bus, this is a curious policy. Free or subsidized parking must be eliminated if we're to make a serious attempt at addressing congestion.

In addition, an automobile traveling on freeways and arterial systems in the peak hours of congestion pays essentially the same tax rate as an automobile traveling in the off-peak. The rush-hour drivers don't pay the full costs of their travel; they're subsidized by the people who travel before or after rush hour. The imposition of a peak-hour toll or charge would help eliminate this subsidy. While this option is economically attractive and technically feasible, however, it would face a tough political test simply because most of our interstate system was built as a "freeway."

The Dulles Airport Access Toll in Washington, D.C. is now installing an electronic fee system that could charge different prices for different times of the day. This system, which allows vehicles to enter and exit the tollway without stopping, reads an electronic license plate on the car and levies charges against that automobile's account. The same technology has been used on toll bridges in California and is being tested on heavy trucks traveling through Western states. The technology is cheap and available and could be used to charge for parking, gasoline, and other vehicle-related services as well.

If we take no overt action to manage demand, we will automatically implement one of the most effective demand management strategies that exists today—congestion. Heavy traffic in a dense urban area affects many aspects of our travel. We avoid areas we might otherwise drive through, travel at odd hours, have shorter meetings in areas that have high congestion, or change our residences or jobs. Congestion, however, is a highly inefficient demand management technique, one that causes pollution, accidents, and lost time. Are we willing to pay the congestion "toll"?

Where Do We Go from Here?

Given the right land-use and demand management strategies, a good case could actually be made for a rail system in the central Puget Sound area. The topography and relatively high density level in many parts of the region make rail a better bet here than in most West Coast cities that have recently developed light rail systems. That isn't enough to make it work, however. We're going to have to provide compatible land-use and demand management strategies and then convince ourselves that light rail is more cost-effective than a bus system.

When we think of bus systems, let's not confine ourselves to local buses operating on crowded arterials, but rather think of larger buses, perhaps even linked together to travel as trains on guideways, splitting off to go their separate ways to deliver people to their jobs or homes. What's most important is that the voters in the central Puget Sound area understand exactly what they're buying, and that planners and politicians don't sell them a system on promises that can't be kept, as has happened with nearly every other transportation system developed in this country in the last 30 years. If people know exactly what a transit system will do and if they're willing to pay a premium to have one technology over another, that's their choice.

The one thing that we all need to keep in mind is that none of these options are going to eliminate congestion in the Seattle area. None of these options are going to reduce congestion below the current level, but some of them may reduce future congestion increases and provide an alternative means of transportation for those willing and able to take it.

G. Scott Rutherford is an associate professor of civil engineering at the University of Washington, the director of the Washington State Transportation Center, and a former member of the Washington State Rail Development Commission.

The Use of Pacific Northwest Wood Products in Japan

by W. Ramsay Smith

The Japanese have, for more than 6,000 years, prized the use and appearance of wood, and the material plays an important role in their cultural and personal lives. Wood shrines and temples can be found throughout the country, and the owners of wood homes in Japan display the wood's beauty with reverence and special care.

We often think of Japan as a crowded island with very high land prices and limited space for residential construction. Yet approximately 68 percent of this mountainous island nation's 62-million-acre surface is forested. Of this total, 34 million acres are covered by natural forest and the remaining 8 million acres consist of plantations of trees. The majority of these trees, which were planted after World War II, are too young to harvest, so more than 61 percent of the forest products the Japanese consumed in 1988 were imported.

Although Japanese lifestyles and building practices are changing in many respects, the construction industry still relies heavily on the use of wood and other forest products. Given the enduring fondness the Japanese have for wood, American forest products firms could find tremendous opportunity in the import market, if they take the time to learn the intricacies of the current market and examine the means through which they can enter that arena.

The Import Market

In 1988 the Japanese used 3.8 billion cubic feet of forest products, and of that total, 60 percent was in the form of solid wood products. Approximately 70 percent of the solid wood imports were logs, 20 percent consisted of lumber, and plywood imports totaled 3 percent. The 1.1 billion cubic feet of logs that Japan imported supplied the country's 17,886 sawmills, 147 plywood mills and 49 veneer mills. (Japan's desire to import as much raw material as possible is explained in part by the existence of so many politically influential mill-owners.) The South Sea countries (Malaysia, Philippines, Singapore, and a number of South Pacific Islands) provided 40 percent of the logs, the United States 32 percent, and Russia 20 percent. Nearly 38 percent of the imported lumber came from Canada, another 31 percent was from the United States, and the South Sea countries furnished 18 percent. Almost all of the plywood came from the South Sea countries.

Most of the wood exports from the United States originated in the Pacific Northwest. In 1988 U.S. sales of wood and wood products to Japan equaled $3.1 billion, and Washington and Oregon sold nearly $2 billion of that total. Washington State, in fact, exported $1.5 billion of wood and wood products —principally softwood logs—to Japan.

Housing starts provide a good indication of the continuing strength of the import market. Japanese housing starts, which have increased each year for the past five years, were estimated at 1.7 million in 1988. Although some reduction may occur, forecasters estimate that starts will remain at the 1.2 million to 1.6 million level well into the 1990s. Japan needs to replace existing, dilapidated housing, and the government, in an attempt to draw people from large cities, has begun a program to establish more industry—and more housing—in rural areas.

Housing starts alone are not a complete measure of forest products consumption, however. The number of wood structures has declined from 65 percent to less than 43 percent of all housing starts in the last 10 years. This drop is the result of an increase in multifamily housing, which is constructed with nonwood materials to satisfy fire and structural code regulations. The rising cost of traditional wood housing has also led to an increase in prefabricated houses, which are primarily of concrete and steel. Nonetheless, since wood structures in Japan are primarily single-family residences, the amount of wood structure floor space totals 54 percent of the space constructed in 1988.

Japanese Construction Methods

The majority of single-family residences are built using traditional post-and-beam construction methods. Of the almost 700,000 wood structures built in 1988, for example, more than 655,000 were post-and-beam, compared with 43,000 that used nontraditional platform-frame methods.

Traditional post-and-beam construction requires the use of larger timbers, which are milled in metric dimensions. This type of structure, though beautiful, is expensive to build, because of the variety of structural components and their assorted sizes. Labor costs constitute another major expense; large amounts of worker hours are required to handle and cut individual pieces to size, and the compound joint angles and notches for bracing add to the labor costs. In addition, a single crew is used for each construction project, and a year's construction time is common.

Prefabricated concrete and steel housing, introduced in the early 1970s, has grown steadily in market share. In 1988 prefabricated structures totaled 251,000 units, or 15 percent of the housing market. The prefabricated house is cost competitive and, unlike a conventional Japanese wood home, has a short construction time. Concrete and steel houses, however, cannot provide the same natural feeling that wood offers, and for that reason these custom-designed homes probably have limited market potential.

Western platform-frame wood houses began appearing in Japan in 1974, and the number of these nontraditional homes increased to more than 43,000 per year in 1988, or about 3 percent of total housing starts. Platform-frame homes were intro-

duced by the Canadians, who were marketing North American softwood lumber to replace post-and-beam construction. The Japanese have incorporated the use of dimension lumber (two by fours, etc.) and modified the design of the platform-frame structure to maintain many traditional construction elements. The Japanese-style platform-frame home uses a three-foot by six-foot building dimension—a unit of measure based on the size of a tatami mat. The construction technique offers no significant cost or time savings, compared with Japanese prefabricated homes, so the only attraction for the home buyer is the use of wood.

A third housing market is now emerging in Japan. The U.S. platform-frame home uses a construction system based on a four-foot by eight-foot building dimension. The construction process employs specialized crews for different construction phases and is less expensive than either traditional Japanese construction or the modified platform-frame style. And the U.S. platform-frame home brings with it, of course, the potential for increasing the amount of forest products we export to Japan.

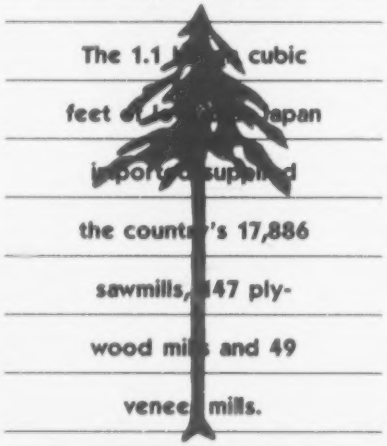
Homes are expensive in Japan. Land prices range from $100,000 to $500,000 or more (assuming that $1 equals 140 yen) for lots that measure between 1,000 and 3,000 square feet. The construction cost for an average 1,350-square-foot home is between $150,000 and $200,000 and the price is increasing. The average homeowner in Japan will spend six to 10 times his or her annual salary for a house; Americans will pay approximately three times their yearly salaries.

Since the cost of land in Japan is extremely high, homeowners are looking for ways to reduce construction costs. In addition to the cost-saving features of the platform-frame house, the structure offers heating and cooling advantages that traditional Japanese construction can't equal. Once these homes meet the cost and quality criteria of the Japanese government, they will become eligible for low-interest loan rates.

The Market Potential and the Competition

Traditional Japanese post-and-beam construction necessitates the use of appearance-grade lumber, which Northwest old-growth timber can provide. If a U.S. platform-frame construction system becomes more common, however, second- and third-growth trees could readily fill the demand. In addition, the promotion of this construction method could mean that trade exports to Japan —in the form of value-added products such as doors, windows, hardware, and fixtures— will increase substantially.

New opportunities within the export market, however, require background work before they can be fully realized. To increase the supply of construction materials exported to Japan, U.S. suppliers will have to transfer the technology of the new platform-frame construction system, as well as furnish the technical information needed to persuade Japanese officials to change building codes and product specifications, which are now biased against wood construction. In addition, Japan has no labor pool trained in U.S. construction methods, so firms will need to provide the training—through workshops, technical schools, and videos—that can produce the homes.



The Pacific Northwest's major competitor in the construction materials market is Canada, which shipped 113 million cubic feet of lumber to Japan in 1988, compared with 81 million shipped from the United States. Canada has, through its Council of Forest Industries, demonstrated a long-term commitment to meeting the needs of its Japanese customers, who expect such services. The council established a Tokyo office about 15 years ago, and has a staff of eight or so representatives. There are, in comparison, two people who promote the general United States forest products industry, one employed by the American Plywood Association and the other by the Western Wood Products Association.

Even though the platform-frame market in Japan has great potential, the traditional housing market is vastly larger—and more difficult for U.S. producers to enter. Manufacturers would have to make a large and long-term commitment to produce materials that meet the standards of a foreign market, for no equivalent domestic market exists. A mill would need to produce the metric dimensions and grades that would be acceptable to the Japanese, as well as determine what to do with the excess or odd sizes that wouldn't meet Japanese specifications and would simply accumulate at the mill site. The current prosperity of a relatively small number of Northwest mills illustrates that this market can be supplied successfully. These mills report that they spent, on average, five years establishing their Japanese markets, but they now have more business than they can supply.

Developing a Following

A number of agencies have been active in the effort to increase the flow of wood products from the Northwest, to help satisfy Japan's demand for forest products, and to improve the acceptance of the platform-frame home. These organizations include the University of Washington's Center for International Trade in Forest Products (CINTRAFOR), Washington State University's International Marketing Program for Agricultural Commodities and Trade (IMPACT) and the Wood Material and Engineering Laboratory, the Department of Trade and Economic Development for the State of Washington, the Evergreen Partnership, the American Plywood Association, and the Western Wood Products Association.

Two projects that involve several of these agencies are Seattle Village and Washington Village in Kobe, Japan. Both model-home projects, which have the support of Japan's Government Housing Loan Corporation (GHLC) and the Hyogo Prefectural Government, repectively, are designed to teach Japanese builders the details of platform-frame construction techniques.

The Government Housing Loan Corporation, which is comparable to our federal mortgage program, provides 30 to 40 percent of all Japanese home loans. One of the agency's mandates is to emphasize the construction of quality homes at lower costs. In addition, the GHLC has been directed to participate in the government's effort to reduce the trade deficit between the United States and Japan by increasing imports of forest products. The result is Seattle Village, a 13-home study of Western-style construction, based on the use of a four-by-eight unit.

The term Seattle Village originates from

the Seattle-Kobe sister-city relationship, and the City of Kobe owns the site on which this project is being built. Vancouver Village, which features Canadian housing designs and materials and is also sponsored by the GHLC, was built on an adjacent site. Both model villages were completed in July 1989 and homes sales are underway.

During the construction process, the supervisors of the Seattle Village project conducted an analysis of the designs, building methods, and cost of the platform-frame construction technique. The results of the study are being published in two forms; one is an assessment of the construction process and a comparison of the platform-frame technology with other Japanese construction, and the other is a specification guide for platform-frame construction that Japanese architects and builders can use to satisfy GHLC funding requirements.

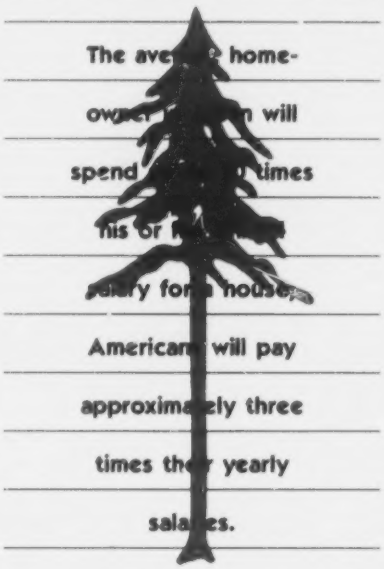
Both Seattle Village and Vancouver Village projects have had problems obtaining the necessary visas for the framing crews that were imported from the United States and Canada. The completion of Vancouver Village, in fact, was delayed by three months for that reason. Even though these are government projects, visas for laborers are highly restricted due to an influx of laborers from other Asian countries.

Another long-term concern that became evident during the construction process is that all forest products materials that enter the country require Japanese Agricultural Standards (JAS) certification if they are to be used in government-funded programs. This certification or stamp can be obtained from the Japanese government by the U.S. manufacturer or the material can be regraded as it enters Japan, but both procedures are expensive.

Washington Village is a separate project developed by Washington State and Hyogo Prefecture. Governor Booth Gardner, during a trip to Japan in September 1987, met with Hyogo Governor Toshitami Kaihara, and the two administrators agreed to expand the sister-state relationship into the arena of economic development. Washington Village, the initial project in this alliance, will be a 170-home tract within a larger development near the city of Kobe. The entire development is called Kobe-Sanda International Garden City and will eventually house more than 90,000 people. To date, the Hyogo Prefecture has invested more than $6 billion in the project.

The new city is divided into four areas: Culture Town, Flower Town, Woody Town, and an industrial Techno Town. Culture Town, the site of Washington Village and Hyogo Village (a section of 530 traditional Japanese homes), will have an international atmosphere. Washington Village will be marketed as a Western neighborhood, and all the forest products and other materials that go into its construction will, to the extent possible, be from Washington State.

Washington Village is a marketing tool for the state's forest products industry and spotlights Washington as a center for housing technology and as a primary source for building products. The high-quality designs and wood products that will be displayed in these homes will attract future homeowners, and the transfer of construction



technology will increase the long-term demand for value-added forest products from the state.

The Washington State legislature has appropriated $200,000, which will be combined with other state monies, to fund advisors and the creation of teaching aids, video presentations, construction manuals, and training sessions. The Evergreen Partnership has agreed to work with the Department of Trade and Economic Development to raise matching funds. In addition, a Washington State advisory committee, composed of representatives from government, academia, and the private sector, will coordinate the state's involvement in the project.

Other projects using the four-by-eight module are taking place throughout Japan. These range in size from individual homes, which are prepackaged in this country, to developments as large as Washington Village. The prepackaged homes can include anything from logs for log homes to framing components to bathroom fixtures, carpets, and paint. These value-added exports represent a cost savings for Japanese homeowners in that import duties are only 3.9 percent for prefabricated structures, compared with 8 to 20 percent for some construction materials.

Understanding the Market

The market outlook for Pacific Northwest forest products is bright (and will be even brighter once Japanese barriers to imports are lowered). Like any market, however, this one has to be understood and nurtured. Suppliers, for example, must learn to adapt to Japanese business standards and not automatically expect their clients to understand how Americans do business. This process has been somewhat difficult for the forest products industry—it has historically had an excellent domestic market and hasn't had to develop the marketing skills now required to attract Japanese customers.

The Japanese market is potentially large, but until the platform-frame design creates additional demand, the immediate opportunity is for the industries that supply construction materials for traditional single-family homes. New mills interested in entering this market should anticipate that they will spend their first several years simply learning about the market and their customers. Their budgets should cover expenses for travel to Japan and include funds for entertaining visiting guests. These firms will also have to consider what effect selling to a foreign market will have on their domestic sales.

To promote the platform-frame market, forest products firms should work with other producers to emphasize the advantages of U.S. construction methods and explain how this home design can lower construction costs, maintain or increase quality, and strengthen the export of U.S. construction materials. This market is small at this point, but it appears to have strong potential.

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